# DOCUMENT RESUME

ED 152 569 SE 024 115

| | |
|---|---|
| TITLE | Principles of Pesticide Use, Handling, and Application: Instructional Modules for Vocational Agriculture Education. Student Manual. |
| INSTITUTION | Ellis Associates, Inc., College Park, Md. |
| SPONS AGENCY | Environmental Protection Agency, Washington, D.C. Office of Pesticide Programs. |
| PUB DATE | Jan 76 |
| CONTRACT | EPA-68-01-1936 |
| NOTE | 376p.; For related document, see ED 120 426; Not available in hard copy due to colored pages throughout entire document |
| AVAILABLE FROM | Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Stock Number 055-004-00012-9, $5.90) |
| EDRS PRICE | MF-$0.83 Plus Postage. HC Not Available from EDRS. |
| DESCRIPTORS | *Agricultural Chemical Occupations; Agricultural Education; Agricultural Safety; Behavioral Objectives; Certification; Course Content; *Curriculum Guides; Disease Control; Federal Legislation; *Instructional Materials; Job Training; Learning Activities; *Pesticides; Science Education; *Vocational Agriculture |

ABSTRACT

This training package is designed to present the basic principles of pesticide use, handling, and application. Included in this package is information on federal laws and regulations, personal safety, environmental implications, storage and disposal considerations, proper application procedures, and fundamentals of pest management. Successful completion of these training modules will equip the student with the basic requirements for private applicator pesticide certification as identified by federal laws. The 11 training modules cover the following areas: an introduction; pests; environmental protection; pesticides; labels and labeling; personal safety and first aid; safety before, during, and following application; formulation and application; equipment and its use; disposal and storage; and recordkeeping and liability. Each unit is planned for one or more lessons or class periods and includes behavioral objectives, suggested activities for teacher and student, information sheets, assignment sheets, visual aids, tests and test answers. (Author/BB)

***********************************************************************
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
***********************************************************************

ED152569

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Bernard J. Lukco

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

SE 024 115

# PRINCIPLES OF PESTICIDE USE, HANDLING, AND APPLICATION

## Instructional Modules for Vocational Agriculture Education

Developed for

Office of Pesticide Programs

Environmental Protection Agency

Under

Contract No. 68-01-1936

January, 1976

Use of brand or trade names or commercial products in this publication does not imply endorsement of the products or recommendation for their use.

---

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $5.90

Stock No. 055-004-00012-9

# TABLE OF CONTENTS

Page

Foreword . . . v

Use of this Publication . . . vii

Acknowledgements . . . xi

Selected Audiovisual Materials . . . xiii

Selected References . . . xv

Introduction (Unit I) . . . 1

Pests (Unit II) . . . 15

Environmental Protection (Unit III) . . . 67

Pesticides (Unit IV) . . . 109

Labels and Labeling (Unit V) . . . 151

Personal Safety and First Aid (Unit VI) . . . 195

Safety Before, During, and Following Application (Unit VII) . . . 235

Formulation and Application (Unit VIII) . . . 279

Equipment and Its Use (Unit IX) . . . 321

Disposal and Storage (Unit X) . . . 365

Record Keeping and Liability (Unit XI) . . . 399

Appendix: *The Federal Insecticide, Fungicide, and Rodenticide Act*

# FOREWORD

This training package is designed to present the basic principles of pesticide use, handling, and application. Included in this package is information on federal laws and regulations, personal safety, environmental implications, storage and disposal considerations, proper application procedures, and fundamentals of pest management. Successful completion of these training modules will equip the student with the basic requirements for private applicator pesticide certification as identified by federal laws.

This training package is designed in modular form suitable for use by men and women studying vocational agriculture. These modules form a complete self-contained training program sufficient to train and test knowledge and skills of the safe and correct use of pesticides.

This training package presents basic concepts and principles of pesticide use and application. The student must recognize that individual exceptions to these principles exist and that label instructions should be followed if a discrepancy arises.

Teachers should consult state and local experts frequently to maintain updated information with regard to federal, state, and local laws and regulations. Teachers are especially encouraged to contact the State Extension Pesticide Applicator Training Coordinators for specific state requirements and laws relating to pesticide certification programs and to add objectives as needed. When a teacher adds objectives, information and assignment sheets, transparencies, and criterion tests should be supplied.

# USE OF THIS PUBLICATION

## Instructional Units

Public Law 94-140 requires that individuals who are applicators of restricted use pesticides be certified by October, 1977, and thereafter. These instructional modules will train prospective private pesticide applicators to meet the certification requirements under the federal guidelines. The information contained in these instructional modules is also pertinent to all persons interested in pesticide use, handling, and application.

The modules cover eleven content areas. Each area consists of one unit of instruction including behavioral objectives, suggested activities for teacher and student, information sheets, assignment sheets, visual aids, tests, and answers to the tests. Units are planned for one or more lessons or class periods of instruction.

Careful study of each instructional unit by the teacher will help to determine:

A. The amount of material that can be covered in each class period.
B. The skills which must be demonstrated.
    1. Supplies needed
    2. Equipment needed
    3. Amount of practice needed
C. Supplementary materials that must be ordered, such as pamphlets, slide series, video tapes, movies, and filmstrips.
D. Resource people who must be contacted.

## Objectives

Each unit of instruction is based on behavioral objectives. These objectives state the goals of the unit thus providing a sense of direction and accomplishment for the student.

Behavioral objectives are stated in two forms. Terminal objectives state the subject matter to be covered in a unit of instruction and specific objectives state the student performance necessary to reach the terminal objective.

Since the objectives of the unit provide direction for the teaching-learning process, it is important for the teacher and students to have a common understanding of the intent of the objectives. A limited number of performance terms have been used in the objectives for this curriculum to assist in promoting the effectiveness of the communication among all individuals using the materials.

Following is a list of performance terms and their synonyms which were used in this material.

| Name | Identify | Describe |
|---|---|---|
| Label | Select | Define |
| List in writing | Mark | Discuss in writing |
| List orally | Point out | Discuss orally |
| Letter | Pick out | Interpret |
| Record | Choose | Tell how |
| Repeat | Locate | Tell what |
| Give | | Explain |

Order
Arrange
Sequence
List in order
Classify
Divide
Isolate
Sort

Distinguish
Discriminate

Reading of the objectives by the student should be followed by a class discussion to answer any questions concerning performance requirements for each instructional unit.

## Suggested Activities

Each unit of instruction has a suggested activities sheet outlining steps to follow in accomplishing specific objectives. The activities are listed according to whether they are the responsibility of the instructor or the student.

> Instructor: Duties of the instructor will vary according to the particular unit. However, for best use of the material they should include the following: provide students with objective sheet, information sheet, and assignment sheets; make transparencies and arrange for resource materials and people; discuss terminal and specific objectives and information sheet; give test. Teachers are encouraged to use any additional instructional activities and teaching methods to aid students in accomplishing the objectives.
>
> Student: Student activities are listed which will help the student to achieve the objectives for the unit.

## Information Sheets

Information sheets provide content essential for meeting the cognitive (knowledge) objectives of the unit. The teacher will find that information sheets serve as an excellent guide for presenting the background knowledge necessary to develop the skills specified in the terminal objective.

Students should read the information sheets before the information is discussed in class. Students may take additional notes on the information sheets.

## Transparency Masters

Transparency masters provide information in a special way. The students may see as well as hear the material being presented, thus reinforcing the learning process. Transparencies may present new information or they may reinforce information presented in the information sheets. They are particularly effective when identification is necessary.

Transparencies should be made and placed in the notebook where they will be immediately available for use. Transparencies direct the class's attention to the topic of discussion. They should be left on the screen only when topics shown are under discussion. (NOTE: Stand away from the overhead projector when discussing transparency material. The noise of the projector may cause the teacher to speak too loudly.)

## Assignment Sheets

Assignment sheets give direction to study and furnish practice for paper-pencil activities to develop the knowledge which is a necessary prerequisite to skill development. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided which may be used by the student and/or teacher for checking student progress.

## Test and Evaluation

Paper-pencil and performance tests have been constructed to measure student achievement of each objective listed in the unit of instruction. Individual test items may be pulled out and used as a short test to determine student achievement of a particular objective. This kind of testing may be used as a daily quiz and will help the teacher spot difficulties being encountered by students in their efforts to accomplish the terminal objective. The teacher may wish to administer discussion test questions orally. Test items for objectives added by the teacher should be constructed and added to the test.

## Test Answers

Test answers are provided for each unit. These may be used by the teacher and/or student for checking student achievement of the objectives.

# ACKNOWLEDGEMENTS

Development and preparation of an instructional manual such as this is contingent upon the cooperation and assistance of a host of agencies, groups, and individuals. Since this instructional manual was contracted for by the Environmental Protection Agency, much of the information included herein was derived from manuals already developed for the E.P.A. as well as from related manuals the agency suggested we review. Sincere appreciation is extended to Bill Hoffman, Project Officer, Office of Pesticide Programs, Environmental Protection Agency for his assistance throughout the contract. In addition, appreciation is extended to Chet Gibbs, Program Leader, Pesticide Chemicals Program, Extension Service, U.S. Department of Agriculture for his comments and suggestions throughout the duration of the contract. Appreciation is also extended to Neville Hunsicker, Bureau of Occupational and Adult Education, U.S. Office of Education for assistance rendered during the contract.

Grateful acknowledgement for critical review of the manual is extended to the members of the Working Group on Training of the Extension Committee on Policy, Extension Service, U.S. Department of Agriculture; the National Vocational Agriculture Project Advisory Committee; representatives of various state departments of vocational education; representatives of state lead agencies; the vocational agriculture teachers who field tested the manual in ten sites throughout the United States; and a host of others who gave their critical comments and suggestions for the improvement of the manual.

Sincere appreciation is extended to Ron Meek, Bob Patton, Pete Braker, and Eddie Smith, former vocational agriculture teachers and now curriculum writers, who worked with Ellis Associates, Inc. staff to develop the manual.

Sincere gratitude and appreciation is expressed to the staff of Ellis Associates, Inc., who worked long and rigorous hours to develop this manual and for their efforts in involving the agencies responsible for private pesticide training -- Environmental Protection Agency, U.S. Department of Agriculture, State Lead Agencies, and the U.S. Office of Education. Of particular note has been the timely and relevant work performed by Frances L. Courtney and Geraldine Nyland in preparation for the regional workshops; the critical review and analysis of materials by Mike Brown; and the technical expertise demonstrated by Sally McDonald. Without such a dedicated staff, the purposes of the contract could never have been fulfilled.

| Project Director | Co-Project Director |
|---|---|
| Dr. Mary L. Ellis, President | Ms. Denise A. Pierce |

# SELECTED AUDIOVISUAL MATERIALS

## Slide - Cassette Series

Pestidide Use Training (420 slides divided into eight chapters with scripts and narrative cassettes) and Apply Pesticides Correctly: Instructor's Manual (classroom guide for use with slide set), United States Environmental Protection Agency. Distributed by the National Audiovisual Center, Government Services Administration, Washington, DC 20409.

Chapter I, "How to Identify Common Pests"--Contains 57 slides and requires approximately 7 minutes

Chapter II, "Pest Control and Pesticides"--Contains 71 slides and requires approximately 8 minutes

Chapter III, "Understanding Pesticide Labels"--Contains 34 slides and requires approximately 5 minutes

Chapter IV, "Using Pesticides Safely to Protect Yourself"--Contains 60 slides and requires approximately 8 minutes

Chapter V, "Protecting the Environment from Pesticides"--Contains 63 slides and requires approximately 9 minutes

Chapter VI, "Pesticide Application Equipment"--Contains 60 slides and requires approximately 8 minutes

Chapter VII, "Calibrating Pesticide Equipment"--Contains 45 slides and requires approximately 6 minutes

Chapter VIII, "Pesticide Laws and Regulations"--Contains 24 slides and requires approximately 4 minutes

Be a Pro with Pesticides (72 slides, script and narrative cassette), Visual Communications, 412S Roberts Hall, Cornell University, Ithaca, NY 14853, ATTN: George Lavris. This set is to be used in conjunction with the film of the same title listed below. Provision is made for student participation.

Be a Pro: Avoid Pesticide Accidents (79 slides, script and narrative cassette). Visual Communications, 412S Roberts Hall, Cornell University, Ithaca, NY 14853, ATTN: George Lavris. This set follows the assignment sheet "Distinguish Between Safe and Unsafe Pesticide Practices."

## Film

Be a Pro with Pesticides (22 1/2 minute 16 mm). Distributed by R. G. Turner, Box 41, Roberts Hall, Cornell University, Ithaca, NY 14853.

Videocassettes

Proper Pesticide Use Series: "Pesticides," (eight chapters) color videocassettes distributed by Oregon State University, Corvallis, Oregon 97331.

Applying Pesticides Properly, (eight chapters) color videocassettes distributed by Kansas State University, Manhattan, Kansas 66506.

(NOTE: Consult your extension agent and other resource personnel for other appropriate audiovisual materials for your geographical location.)

# SELECTED REFERENCES

U.S., Department of Agriculture and Environmental Protection Agency. *Apply Pesticides Correctly: A Guide for Commercial Applicators.* Washington, D.C.: Government Printing Office, 1975.

U.S., Department of Agriculture and Environmental Protection Agency. *Apply Pesticides Correctly: A Guide for Private Applicators.* Washington, D.C.: Government Printing Office, 1975.

Dewey, J. E., et al. *Pesticide Applicator Training Manual.* Ithaca, New York: Cornell University, 1974.

U.S., Environmental Protection Agency. *Standards for Certification of Pesticide Applicators.* Washington, D.C.: E.P.A., Office of Pesticide Programs, 1974.

We gratefully acknowledge the permission extended to us by the Northeast *Pesticide Applicator Training Manual* and the Environmental Protection Agency and United States Department of Agriculture *Apply Pesticides Correctly: A Guide for Commercial Applicators* manual for use of selected art work on transparency masters.

(NOTE: Consult your extension agent and other resource personnel for other appropriate reference manuals and materials for your geographical location.)

# INTRODUCTION
# UNIT I

## TERMINAL OBJECTIVE

After completion of this unit, the student should be able to list problems associated with pesticide usage, match the EPA classifications of pesticides to the correct definitions, and list capabilities of the certified private applicator. This knowledge will be evidenced by scoring eighty-five percent on the unit test.

## SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with the private pesticide applicator certification program to their correct definitions.
2. List problems associated with pesticide usage.
3. Discuss pesticide registration.
4. Match the EPA classifications of pesticides to the correct definitions.
5. List the capabilities of the certified private applicator.
6. Explain the difference between deposit and residue.
7. Explain how tolerances are determined.

## INTRODUCTION
## UNIT I

## SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide student with objective sheet.

  B. Provide student with information sheet.

  C. Make transparency.

  D. Discuss terminal and specific objectives.

  E. Discuss information sheet.

  F. Stress the importance of the correct use of chemicals and the dangers and hazards of improper use.

  G. Invite a resource person to visit with the class concerning the importance of private pesticide applicator certification and applicable federal, state, and local laws and regulations.

  H. Give test.

II. Student:

  A. Read objective sheet.

  B. Study information sheet.

  C. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency master: TM 1--Tolerances Must Be Set

IV. Test

V. Answers to test

## INTRODUCTION
## UNIT I

## INFORMATION SHEET

I. Terms and definitions

   A. Private applicator--A certified applicator who uses or supervises the use of any pesticide classified for restricted use for the purpose of producing any agricultural commodity on the property owned or rented by him or his employer or on the property of another person producing any agricultural commodity in exchange of personal services

   B. Pesticide--Chemical or other substance that will prevent, repel, destroy, or control a pest or protect something from a pest

   C. Tolerance--Maximum amount of pesticide which can legally remain on or in any food or feed crop at harvest or animal at slaughter

   D. Agricultural commodity--Any plant or plant part, animal, or animal product produced by a person

   E. Certification--Recognition by certifying agency that a person is competent and thus authorized to use or supervise the use of restricted use pesticides

   F. Environment--Surroundings, usually water, air, soil, plants, and animals

   G. Exposure--Not protected or shielded; contact with pesticide through ingestion, inhalation, or skin contact

   H. Phytotoxicity--Causing injury to plant life

   I. Hazard--Risk of danger; chance that injury or harm will come to the applicator, other persons, plants, or animals

   J. EPA--United States Environmental Protection Agency

II. Problems associated with pesticide usage

   A. Movement off target--Drift, runoff, leaching, erosion, or evaporation

   B. Improper method of application--Pest not reached or controlled

   C. Overuse--Overdosing and too frequent applications

   D. Underuse, underdosing--Using less than needed amounts

E. Resistance of some pests to certain pesticides

F. Phytotoxicity to plants

G. Exposure to nontarget plants and animals including humans

H. Buildup of some pesticides in animals or in the food chain (accumulation)

I. Residues of some pesticides which remain unchanged in the environment for long periods of time (persistence)

III. Pesticide registration

A. Every pesticide, its label, and each use must be registered before it can be sold or used

B. Definition of registration--Approval by the Environmental Protection Agency of a pesticide for uses as stated on its label

IV. EPA classifications of pesticides

(NOTE: EPA will classify each use of each pesticide as either general or restricted.)

A. General use--Pesticide use which will not cause excessive damage in the environment or endanger the applicator or other persons when applied according to label directions

(NOTE: No certification requirements are necessary on the part of the applicator.)

B. Restricted use--Pesticide use which may cause damage in the environment or endanger the applicator or other persons unless label directions are followed

V. Capabilities of the certified private applicator

(NOTE: Failure to comply with certification may result in penalties or fines of up to $1000 or imprisonment of up to thirty days.)

A. Purchase and use restricted use pesticides to produce agricultural commodities on property owned or rented by himself or his employer

B. Supervise the use of restricted use pesticides to produce agricultural commodities on property owned or rented by himself of his employer

C. Purchase and use restricted use pesticides for use on the property of others with whom he trades services

## INFORMATION SHEET

VI. Deposit and residue

A. Deposit--Pesticide placed on a crop, animal, or surface during application

(NOTE: Sometimes the deposit can be easily seen as with many dusts or wettable powders. Other times it cannot be seen with the naked eye.)

B. Residue--Pesticide that remains on or in a crop or animal or on a surface following application

(NOTE: Some pesticides leave little or no residue. Heat, light, moisture, soil organisms, and other chemical reactions in the environment quickly break them down. Other pesticides are not quickly broken down. They leave a residue on the crop or in the environment for weeks, months, or years.)

VII. How tolerances are determined (Transparency 1)

A. Studies on test animals (rats, guinea pigs, mice, and others) are conducted to determine the acute and chronic toxicity of the chemical

B. Length of time the pesticide remains on the target crop or target animal is measured

(NOTE: The time the pesticide remains active in the environment is also determined.)

C. Possible long-term injury, such as buildup in man or animals, is studied

D. All food or feed which contains even a tiny amount of pesticide residue at harvest or slaughter must have a tolerance

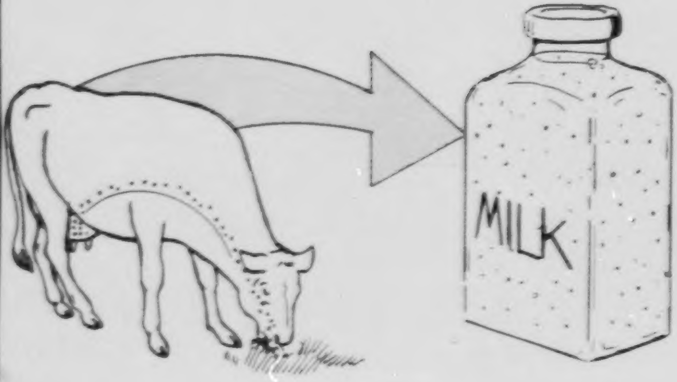
E. Residue in food or feed may be result of direct or indirect contact with pesticide

F. Tolerance is always set at least 100 times smaller than the highest dose which has no effect on test animals

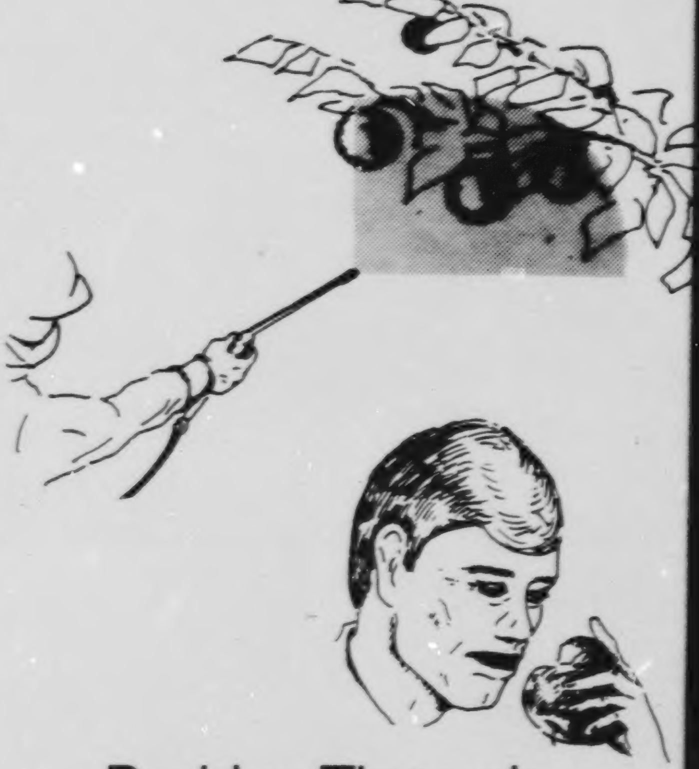
Example: If 200 parts per million of a pesticide have no effect on test animals, then the tolerance for the pesticide on any food or feed crop could be no higher than 2 parts per million (ppm)

G. Food or feed which is intended to be eaten must be below the tolerance level

# Tolerances Must Be Set



Residue Through
Indirect Contact



Residue Through
Direct Contact

## INTRODUCTION
## UNIT I

## TEST

1. Match terms on the right to the correct definitions on the left by placing the appropriate numbers in the blanks provided.

______a. Maximum amount of pesticide which can legally remain on or in any food or feed crop at harvest or animal at slaughter

______b. Recognition by certifying agency that a person is competent and thus authorized to use or supervise the use of restricted use pesticides

______c. Not protected or shielded; contact with pesticide through ingestion, inhalation, or skin contact

______d. Risk of danger; chance that injury or harm will come to the applicator, other persons, plants, or animals

______e. A certified applicator who uses or supervises the use of any pesticide classified for restricted use for the purpose of producing any agricultural commodity on the property owned or rented by him or his employer or on the property of another person producing any agricultural commodity in exchange of personal services

______f. Chemical or other substance that will prevent, repel, destroy, or control a pest or protect something from a pest

______g. Causing injury to plant life

______h. Surroundings, usually water, air, soil, plants, and animals

______i. Any plant or plant part, animal, or animal product produced by a person

______j. United States Environmental Protection Agency

1. Private applicator
2. Pesticide
3. Tolerance
4. Agricultural commodity
5. Certification
6. Environment
7. Exposure
8. Phytotoxicity
9. Hazard
10. EPA

2. List four problems associated with pesticide usage.

   a.

   b.

   c.

   d.

3. Discuss in a short paragraph pesticide registration.

4. Match the EPA classifications of pesticides on the right to their correct definitions.

   _____a. Pesticide use which may cause damage in the environment or endanger the applicator or other persons unless label directions are followed

   _____b. Pesticide use which will not cause excessive damage in the environment or endanger the applicator or other persons when applied according to label directions

   1. General use
   2. Restricted use

5. List two capabilities of the certified private applicator.

   a.

   b.

6. Explain the difference between deposit and residue.

7. Explain how tolerances are determined.

# INTRODUCTION
# UNIT I

## ANSWERS TO TEST

1. a. 3
   b. 5
   c. 7
   d. 9
   e. 1
   f. 2
   g. 8
   h. 6
   i. 4
   j. 10

2. Any four of the following:

   a. Movement off target--Drift, runoff, leaching, erosion, or evaporation

   b. Improper method of application--Pest not reached or controlled

   c. Overuse--Overdosing and too frequent applications

   d. Underuse, underdosing--Using less than needed amounts

   e. Resistance of some pests to certain pesticides

   f. Phytotoxicity to plants

   g. Exposure to nontarget plants and animals including humans

   h. Buildup of some pesticides in animals or in the food chain (accumulation)

   i. Residues of some pesticides which remain unchanged in the environment for long periods of time (persistence)

3. Discussion should include:

   a. Every pesticide, its label, and each use must be registered before it can be sold or used

   b. Definition of registration--Approval by the Environmental Protection Agency of a pesticide for uses as stated on its label

4. a. 2

   b. 1

5. Any two of the following:

   a. Purchase and use restricted use pesticides to produce agricultural commodities on property owned or rented by himself or his employer

   b. Supervise the use of restricted use pesticides to produce agricultural commodities on property owned or rented by himself or his employer

   c. Purchase and use restricted use pesticides for use on the property of others with whom he trades services

6. Explanation should include:

   a. Deposit--Pesticide placed on a crop, animal, or surface during application

   b. Residue--Pesticide that remains on or in a crop or animal or on a surface following application

7. Explanation should include:

   a. Studies on test animals (rats, guinea pigs, mice, and others) are conducted to determine the acute and chronic toxicity of the chemical

   b. Length of time the pesticide remains on the target crop or target animal is measured

   c. Possible long-term injury, such as buildup in man or animals, is studied

   d. All food or feed which contains even a tiny amount of pesticide residue at harvest or slaughter must have a tolerance

   e. Residue in food or feed may be a result of direct or indirect contact with pesticide

   f. Tolerance is always set at least 100 times smaller than the highest dose which has no effect on test animals

   g. Food or feed which is intended to be eaten must be below the tolerance level

# PESTS
## *UNIT II*

### TERMINAL OBJECTIVE

After completion of this unit, the student should be able to list main groups of pests, ways insects damage crops, and causes and symptoms of plant diseases. The student should be able to identify life cycles of insects, state the difference between grasses and broadleaf plants, name sources for aid in identifying pests, and interpret pesticide labels. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

### SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with pests to the correct definitions.
2. List main groups of pests.
3. List ways insects may damage crops.
4. List ways insects affect livestock and man.
5. Name identifying characteristics common to all adult insects.
6. Name characteristics which aid in distinguishing one insect from another.
7. Identify the four stage life cycle of insects.
8. Identify the three stage life cycle of insects.
9. Name identifying characteristics of mites, ticks, and spiders.
10. List vertebrate pest animals.
11. State the difference between grasses and broadleaf plants.
12. Classify plants as annuals, biennials, or perennials.
13. List main causes of plant diseases.
14. Classify causes of plant diseases as parasitic or nonparasitic.
15. List symptoms of plant diseases.
16. Describe symptoms of nematode damage.
17. Name sources for aid in identifying pests.
18. Interpret pesticide labels correctly when given questions concerning pests.

## SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide student with objective sheet.

  B. Provide student with information and assignment sheets.

  C. Make transparencies.

  D. Discuss terminal and specific objectives.

  E. Discuss information and assignment sheets.

  F. Have the student carry out one or all of the following activities:

    1. Find out the names of the common insect pests on your farm. Which kind of life cycle do they have? In what stage of development are they a problem? How do they damage your crops or livestock?

    2. Find out the names of the common weed pests on your farm or in your area. Are they grasses or broadleaf weeds? Are they annuals, biennials, or perennials?

    3. Find out the kinds of plant diseases on your farm or in your area. Are they parasitic or nonparasitic? Find out what is causing them, such as fungus, bacteria, nematodes, drought, or air pollution. What kinds of damage do they cause on your crop?

    4. Start a collection of insects and related pests, plant diseases, and weeds which are common in your area. Be sure they are properly identified and labeled.

  G. Give test.

II. Student:

  A. Read objective sheet.

  B. Study information sheet and take notes.

  C. Complete assignment sheet.

  D. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

  A. TM 1--Insect Damage
  B. TM 2--Adult Insects
  C. TM 3--Wings and Mouthparts
  D. TM 4--Four Stage Life Cycle
  E. TM 5--Three Stage Life Cycle
  F. TM 6--Mite, Tick, and Spider
  G. TM 7--Vertebrate Pest Animals
  H. TM 8--Grasses and Broadleaf Plants
  I. TM 9--Annuals, Biennials, and Perennials
  J. TM 10--Parasitic Causes
  K. TM 11--Nematode Damage
  L. TM 12--Symptoms of Diseases

IV. Assignment Sheet #1--Interpret Pesticide Labels

V. Answers to assignment sheet

VI. Test

VII. Answers to test

# PESTS
## UNIT II

## INFORMATION SHEET

I. Terms and definitions

   A. Organism--Any living thing

   B. Pest--Unwanted organism

   C. Vertebrate--Animal with a bony spinal column

   D. Insect--Small invertebrate animal with three body regions and six jointed legs; may have two, four, or no wings

   E. Mite, tick, and spider--Animals closely related to insects but with two body regions, eight jointed legs, and no wings

   F. Plant disease--Harmful condition which affects plant life

   G. Nematode--Small roundworm that feeds on or in plants and animals

   H. Parasite--Organism that lives and feeds in or on another organism

   I. Life cycle--Stages in the life development of organisms

   J. Larva--Immature stage of an insect that does not look like an adult insect

   K. Pupa--Nonfeeding, usually immobile stage of an insect before becoming an adult

   L. Nymph--Immature stage of an insect that looks similar to an adult insect

   M. Fungus--Small plant which causes rot, mold, and other plant diseases (plural, fungi)

   N. Bacterium--One-celled microorganism which causes wilts, cankers, and other plant diseases (plural, bacteria)

   O. Plant disease symptom or sign--Signal that something is wrong in a plant, such as change in growth habits

   P. Annual--Plant that grows from seed, produces seed the same year, and then dies

   Q. Perennial--Plant that normally lives for more than two years

   R. Biennial--Plant that grows two years, produces seed, and then dies

## INFORMATION SHEET

II. Main groups of pests

- A. Insects
- B. Mites, ticks, and spiders
- C. Plant diseases
- D. Nematodes
- E. Vertebrate animals
- F. Weeds

III. Ways insects may damage crops (Transparency 1)

- A. Feed on foliage, seeds, fruits, and other plant parts
- B. Tunnel or bore into stems, stalks, and branches
- C. Feed on and tunnel in roots
- D. Suck the sap from leaves, stems, and branches
- E. Carry plant disease agents

  (NOTE: Injury caused by insects, plant diseases, and other pests are often confused. Consult a local expert.)

IV. Ways insects affect livestock and man

- A. Blood sucking

  Examples: Flies and lice

- B. Direct attack and spread of disease organisms

  Examples: Mosquitoes carry malaria; ticks carry Rocky Mountain spotted fever

- C. Living on or in the animal

  Examples: Screwworms and cattle grubs

- D. Contaminating agricultural products

  Examples: Granary weevil in grain bins; flour moths in cereals

V. Identifying characteristics common to all adult insects (Transparency 2)

- A. Six jointed legs
- B. Three body regions

  (NOTE: The body consists of the head, abdomen, and thorax.)

## INFORMATION SHEET

VI. Characteristics which distinguish one insect from another (Transparency 3)

- A. Wings

  (NOTE: Some insects have no wings; others have two or four. The wings vary in shape, size, thickness, and structure.)

- B. Mouthparts

  (NOTE: Insects with chewing mouthparts have toothed jaws that bite and tear the food. Insects with piercing-sucking mouthparts have tube-like beaks which they force into a plant or animal to suck out fluids or blood.)

VII. Four stage life cycle of insects (Transparency 4)

- A. Egg
- B. Larva

  (NOTE: The larva is sometimes called a *worm* or *looper*.)

- C. Pupa
- D. Adult

VIII. Three stage life cycle of insects (Transparency 5)

- A. Egg
- B. Nymph

  (NOTE: The nymph, which looks like a tiny adult, goes through several stages in its development.)

- C. Adult

IX. Identifying characteristics of mites, ticks, and spiders (Transparency 6)

- A. Eight jointed legs
- B. Two body regions
- C. No wings

X. Vertebrate pest animals (Transparency 7)

(NOTE: Many vertebrate animals which normally are harmless and desirable can become pests if they interfere with or move into an area where crops and livestock are being produced.)

INFORMATION SHEET

A. Birds

Example: Starling

B. Mammals

Example: Rodent

C. Fish

Example: Carp

D. Reptiles

Example: Snake

E. Amphibians

Example: Salamander

XI. Difference between grasses and broadleaf plants (Transparency 8)

(NOTE: These plants may be annual, perennial, or biennial.)

A. Grasses have long narrow leaves and parallel veins

B. Broadleaf plants have wide, flat leaves and netted veins

XII. Examples of annuals, biennials, and perennials (Transparency 9)

(NOTE: Knowing the life cycle of the weeds to be controlled is helpful in choosing the best herbicide for the job.)

A. Summer annuals--Crabgrass, foxtail

(NOTE: Summer annuals sprout from seed in spring and die before winter.)

B. Winter annuals--Henbit, annual bluegrass

(NOTE: Winter annuals sprout from seed in the fall and die before summer.)

C. Biennials--Mullein, burdock, carrot

D. Perennials--Johnson grass, dandelions

# INFORMATION SHEET

XIII. Main causes of plant diseases

(NOTE: When you find a plant disease problem, you must determine the cause before choosing a control method. Nonparasitic plant diseases have very similar symptoms to parasitic plant diseases.)

A. Nonparasitic

(NOTE: The disease is caused by nonliving agents or materials and cannot be passed from plant to plant. The causes cannot be controlled with pesticides.)

B. Parasitic

(NOTE: The disease is caused by living organisms and may be passed from plant to plant. Usually the farmer can control these by using resistant plants, pesticide chemicals, or other pest management practices.)

XIV. Nonparasitic and parasitic causes of plant diseases

A. Nonparasitic causes

1. Air pollution

   Example: Automobile exhausts

2. Climate

   Examples: Drought, frost

3. Chemicals

   Example: Fertilizer burn

4. Culture

   Example: Injury by machinery

B. Parasitic causes

1. Fungi (Transparency 10)

   Examples: Root rots, scabs, smut

2. Bacteria (Transparency 10)

   Example: Leaf spots, wilts, cankers

3. Viruses

   Example: Mosaics, streaks

4. Nematodes (Transparency 11)

   Example: Root knot nematode

XV. Symptoms of plant diseases (Transparency 12)

- A. Decaying or rotting
- B. Abnormal growth

  Examples: Galls, swelling, leaf curls

- C. Underdevelopment or stunting
- D. Wilting
- E. Discoloration

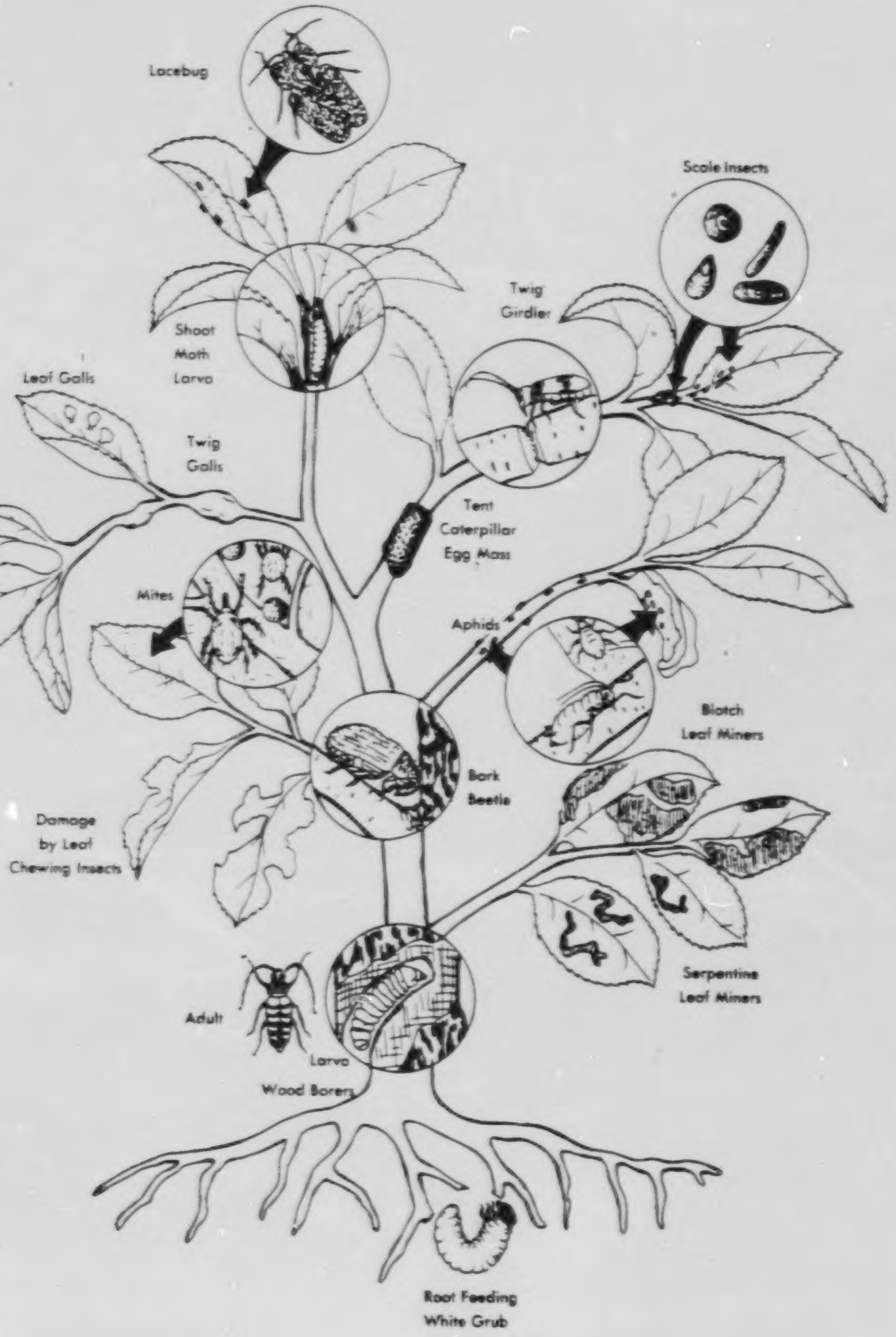
XVI. Symptoms of nematode damage (Transparency 11)

- A. Similar to plant disease symptoms on plant parts above ground
- B. Swollen and misshapen roots and sometimes galls

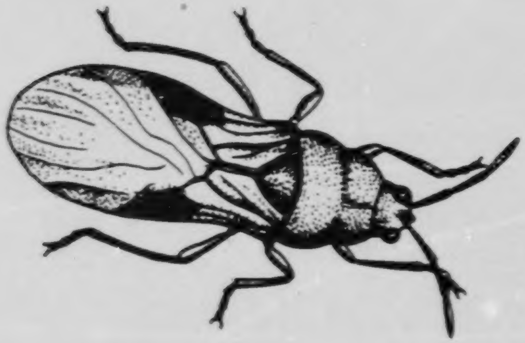
XVII. Sources for aid in identifying pests

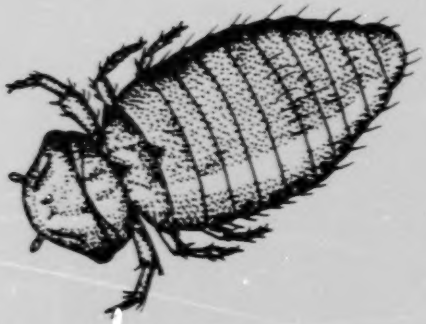
- A. Vocational agriculture instructor
- B. County extension agent
- C. Pesticide dealer or representative
- D. Land grant or other universities

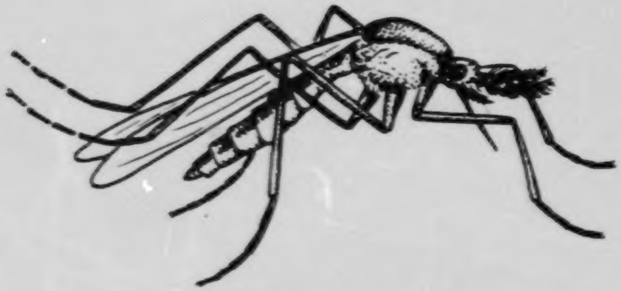
# Insect Damage

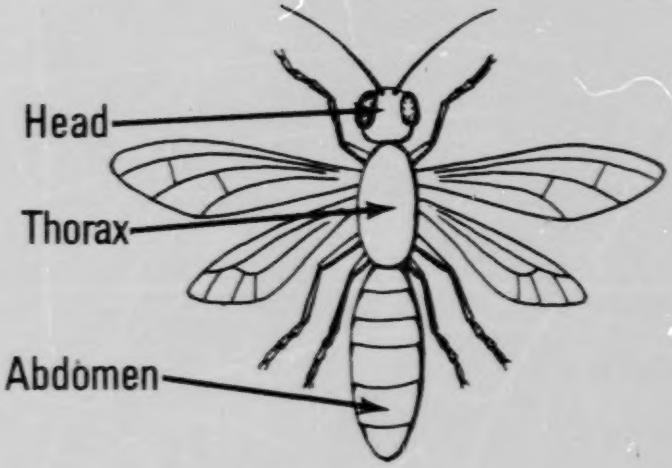

Lacebug
Scale Insects
Twig Girdler
Shoot Moth Larva
Leaf Galls
Twig Galls
Tent Caterpillar Egg Mass
Mites
Aphids
Blotch Leaf Miners
Bark Beetle
Damage by Leaf Chewing Insects
Serpentine Leaf Miners
Adult
Larva
Wood Borers
Root Feeding White Grub

# Adult Insects

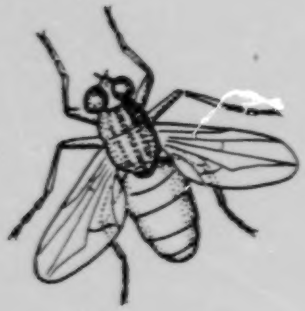




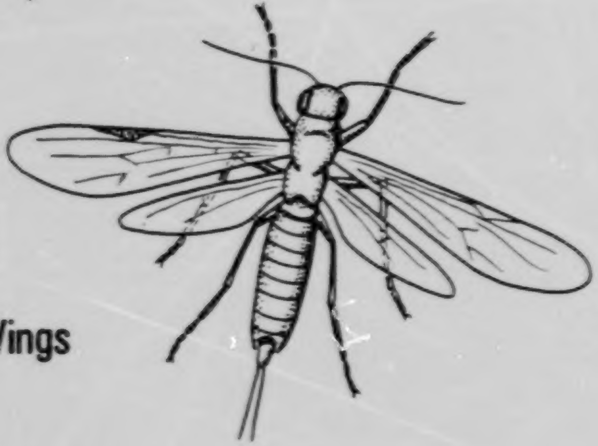



Head
Thorax
Abdomen

# Wings and Mouthparts



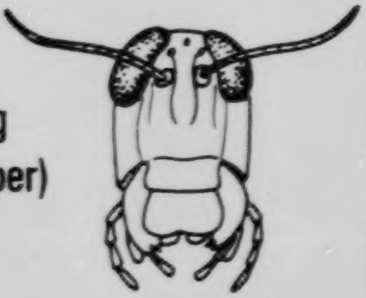
Two Wings



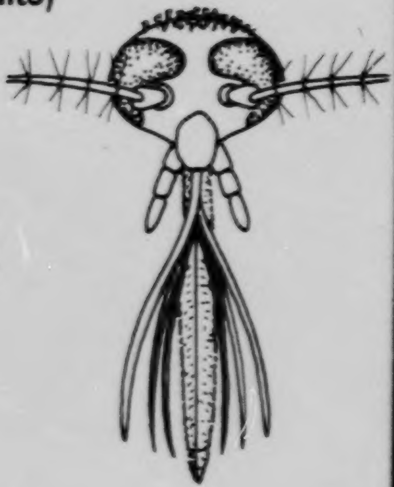
Four Wings

Wings

Chewing
(Grasshopper)

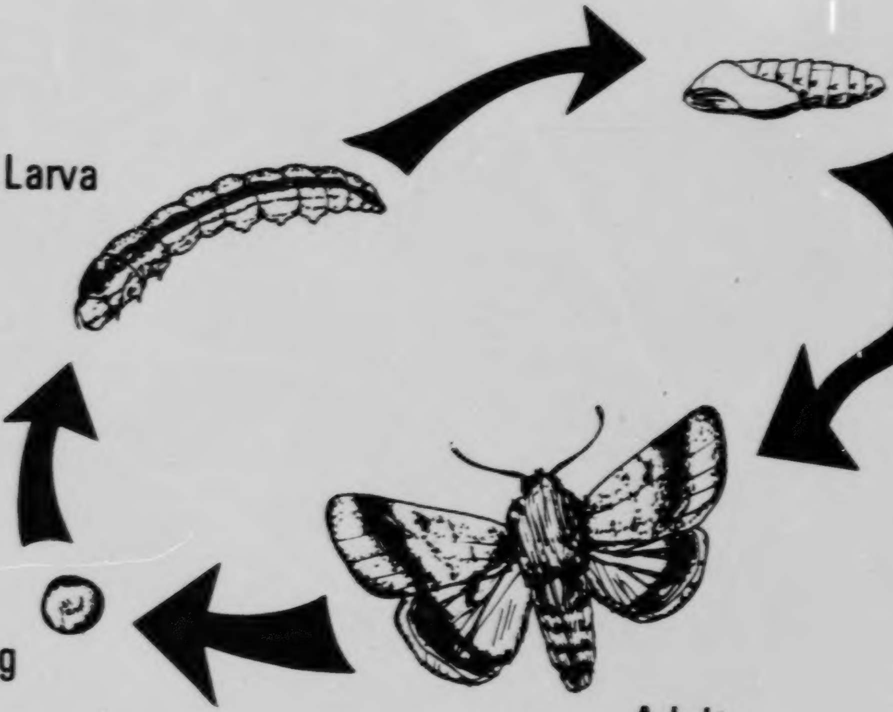


Sucking
(Mosquito)



Mouthparts

# Four Stage Life Cycle



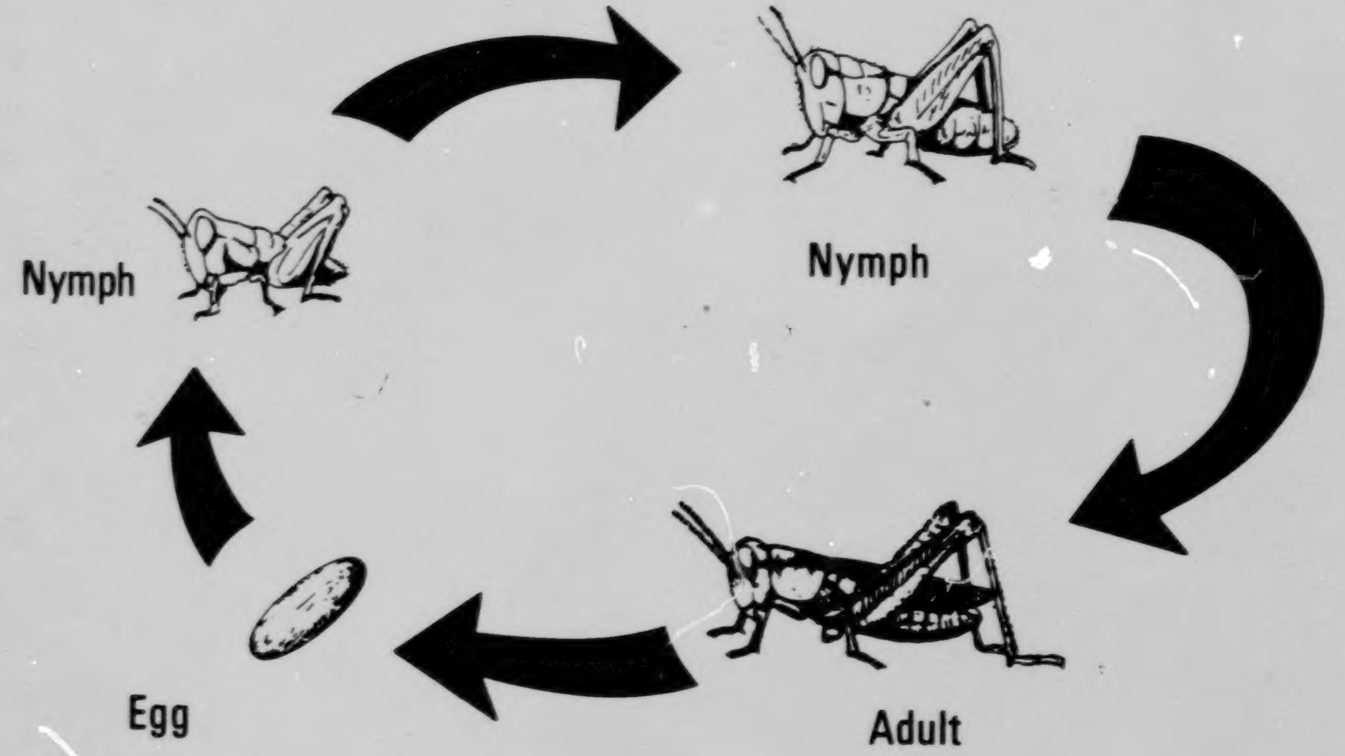
Pupa

Larva

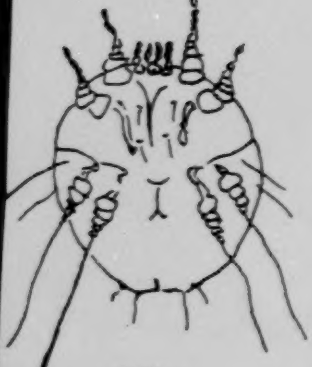
Egg

Adult

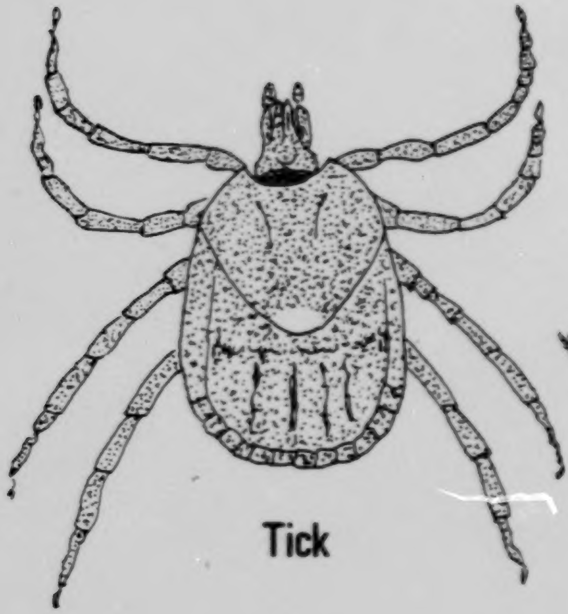
# Three Stage Life Cycle


Nymph
Nymph
Adult
Egg

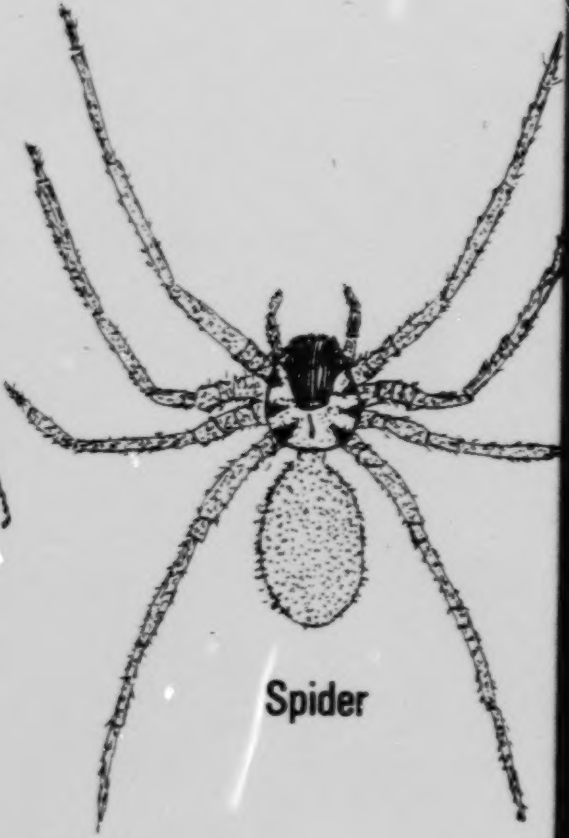
# Mite, Tick, and Spider



Mite

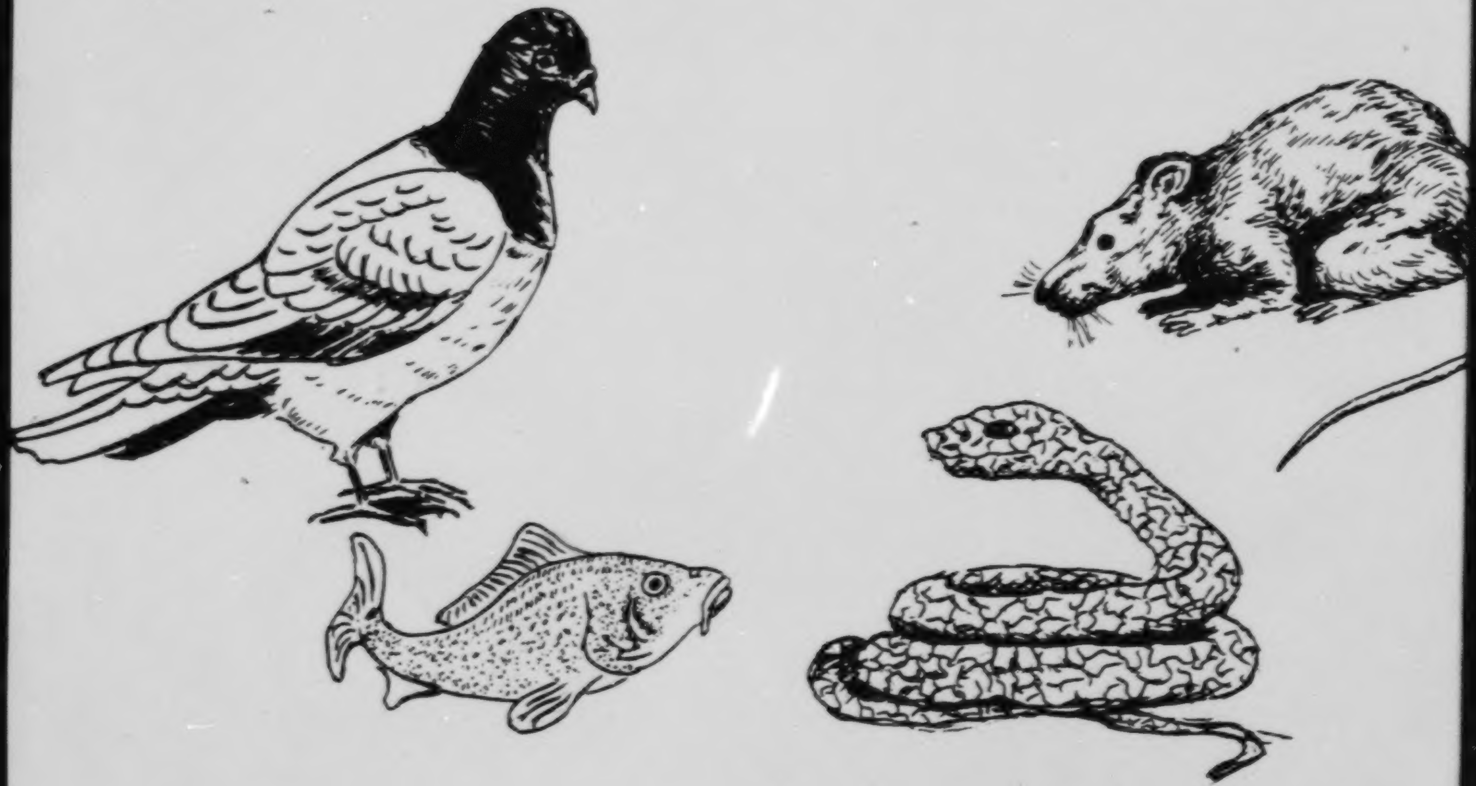


Tick

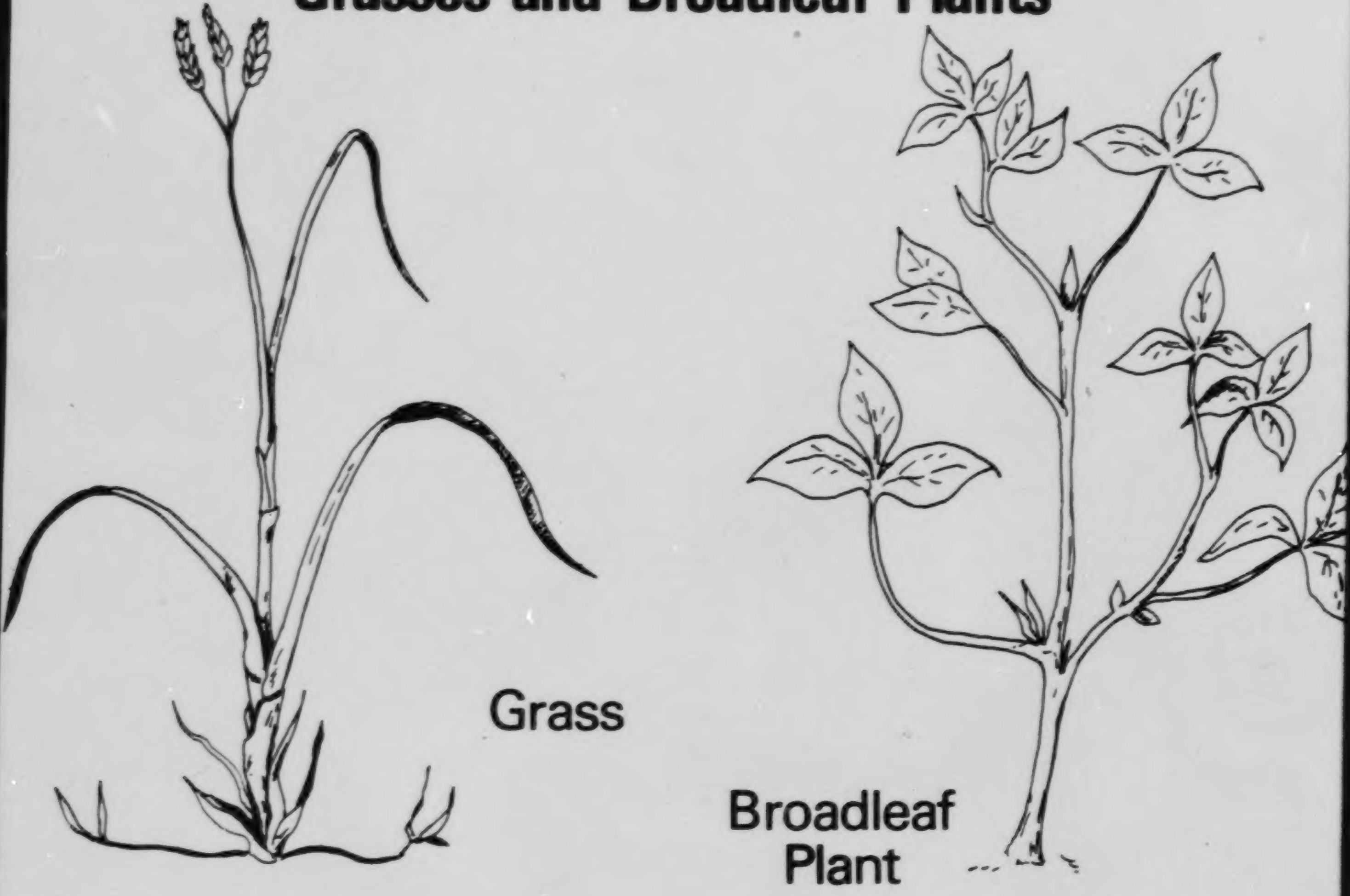


Spider

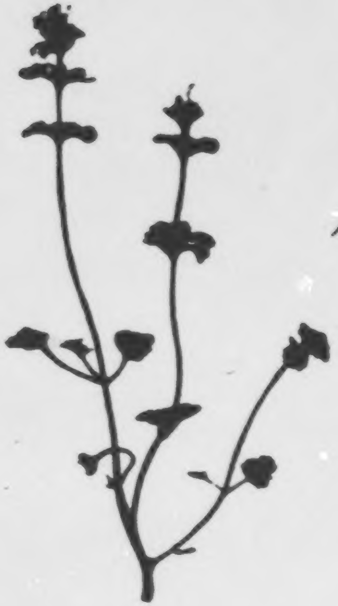
# Vertebrate Pest Animals



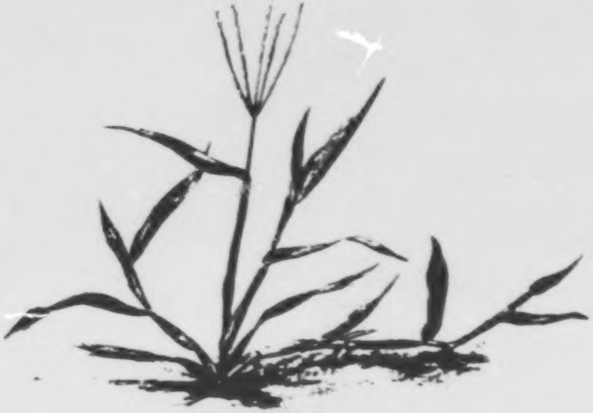
# Grasses and Broadleaf Plants


Grass
Broadleaf Plant

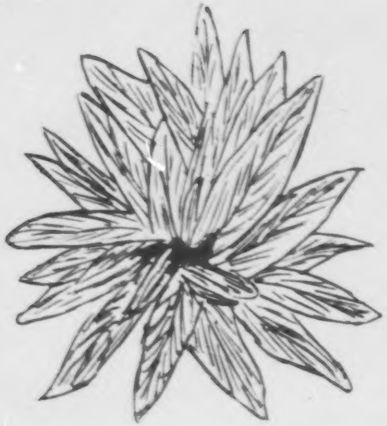
# Annuals, Biennials, and Perennials



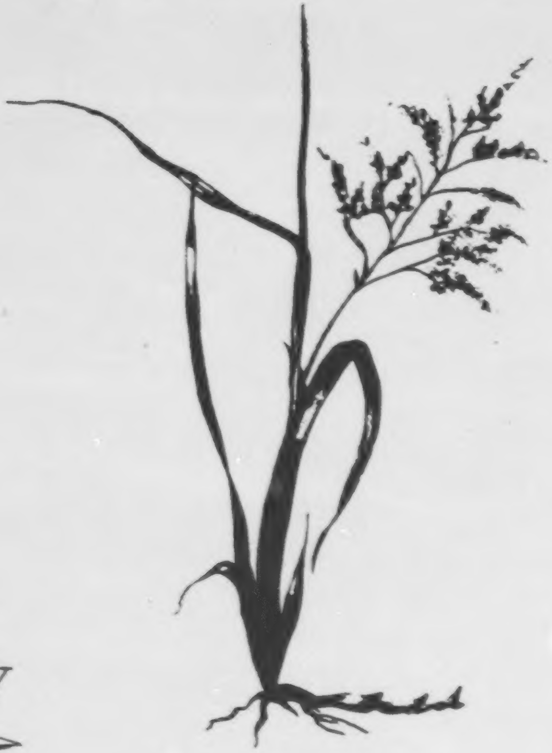
Winter Annual
(Henbit)



Summer Annual
(Crabgrass)

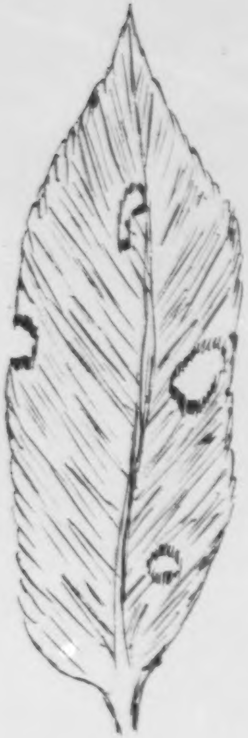


Biennial
(Mullein)

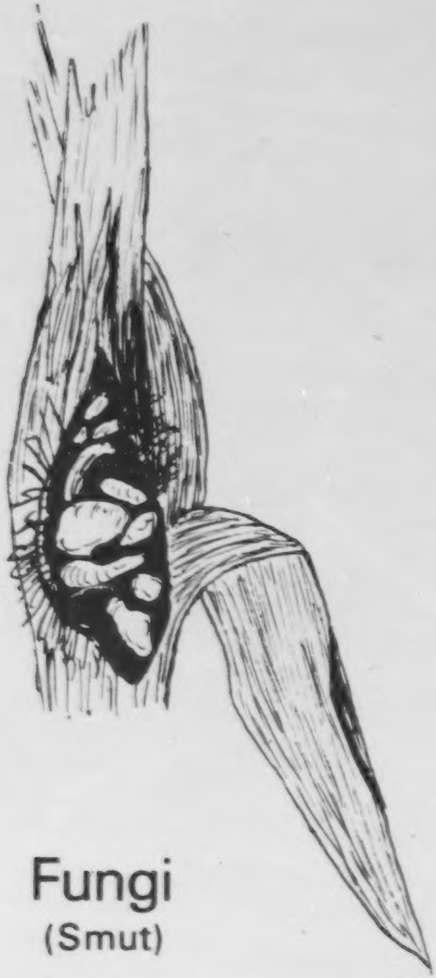


Perennial
(Johnson Grass)

# Parasitic Causes

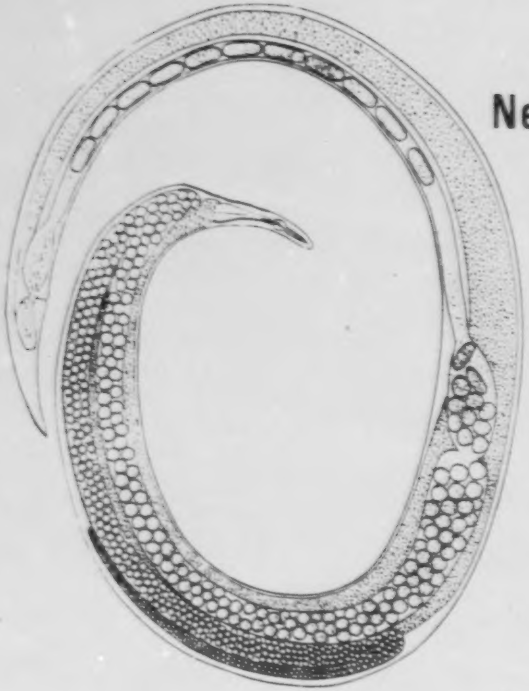


Bacteria
(Leaf Spot)

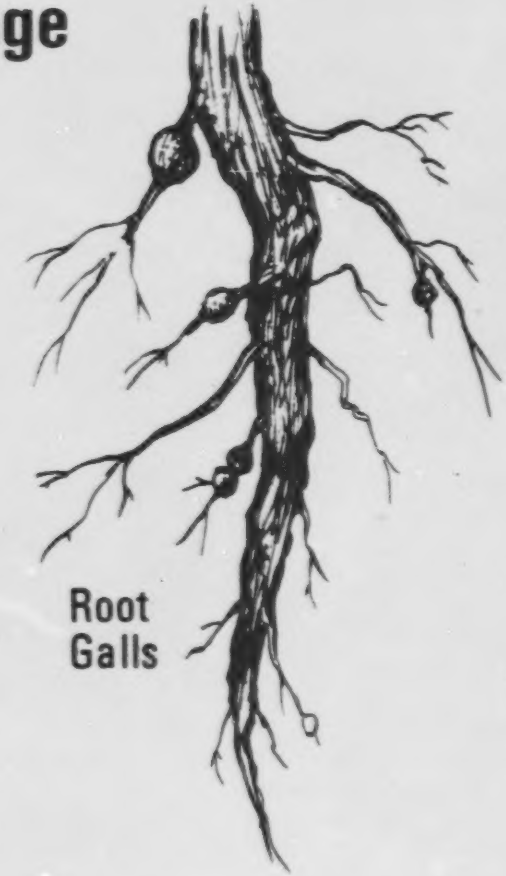


Fungi
(Smut)

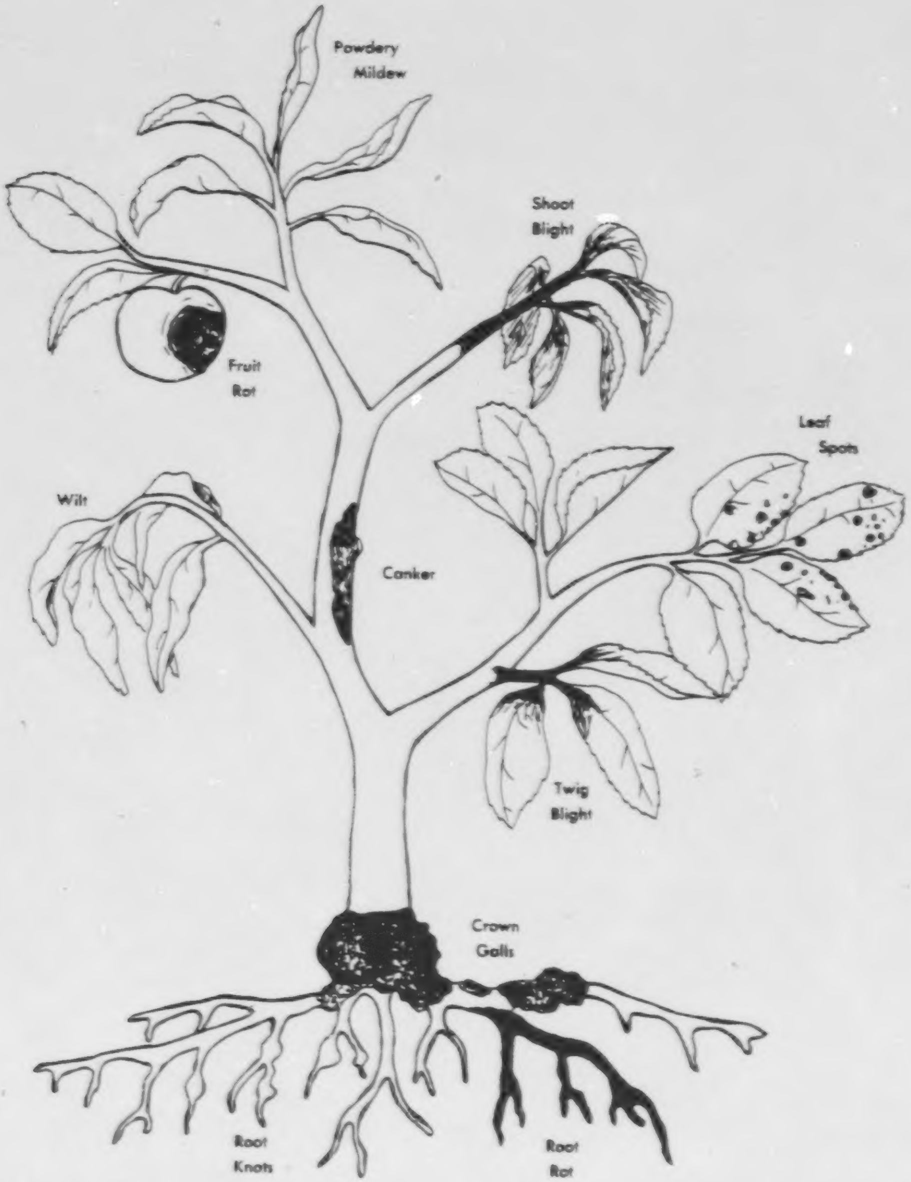
# Nematode Damage



Actual Length Equals 1/50 to 1/25 Inch



# Symptoms of Diseases


Powdery Mildew
Shoot Blight
Fruit Rot
Leaf Spots
Wilt
Canker
Twig Blight
Crown Galls
Root Knots
Root Rot

## ASSIGNMENT SHEET #1--INTERPRET PESTICIDE LABELS

Read the labels provided on the following pages and answer the questions below.

1. Using the De Metho label, answer the following questions.

   a. What type of pests does this pesticide control?

   b. When the label refers to *armyworms* or *cabbage loopers*, to what stage of the insect's life cycle is it referring?

2. Using the No-Disease label, answer the following questions.

   a. What type of pests does this pesticide control?

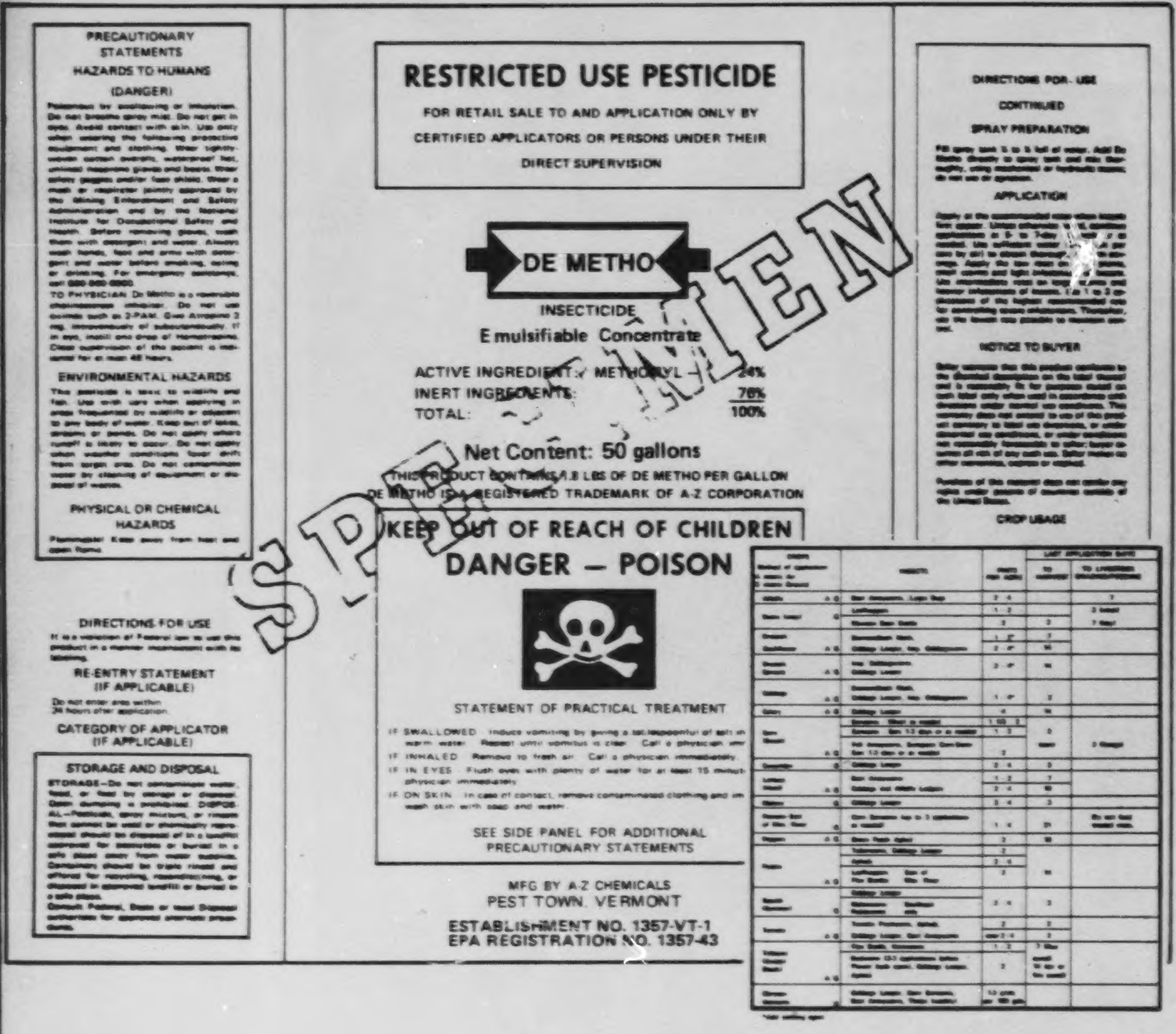
   b. Are the diseases which this pesticide controls parasitic or nonparasitic?

3. Using the Anti-Weed label, answer the following questions.

   a. What type of pests does this pesticide control?

   b. Is it used to control grasses or broadleaf weeds?

   c. Does it control annuals, biennials, or perennials when used on corn?



### PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing. Wear tightly-woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance, call 000-000-0000.

TO PHYSICIAN: De Metho is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eyes, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable! Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within 24 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposed in approved landfill or buried in a safe place.

Consult Federal, State or local Disposal authorities for approved alternate procedures.

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

## DE METHO

INSECTICIDE

Emulsifiable Concentrate

SPECIMEN

ACTIVE INGREDIENT: METHOMYL 24%

INERT INGREDIENTS: 76%

TOTAL: 100%

**Net Content: 50 gallons**

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician im

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minut physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and im wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

ESTABLISHMENT NO. 1357-VT-1
EPA REGISTRATION NO. 1357-43

### DIRECTIONS FOR USE

### CONTINUED

### SPRAY PREPARATION

Fill spray tank ½ to ¾ full of water. Add De Metho directly to spray tank and mix thoroughly, using mechanical or hydraulic means; do not use air agitation.

### APPLICATION

[illegible]

### NOTICE TO BUYER

Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of the product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

### CROP USAGE

| | INSECTS | RATE PER ACRE | LAST APPLICATION DATE | |
|---|---|---|---|---|
| | | | TO HARVEST | TO LIVESTOCK GRAZING/FEEDING |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

ASSIGNMENT SHEET #1

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with.

**ALMONDS**: **Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half to full bloom.

**APPLES, PEARS**: Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP)**: **White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH**: **Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII)**: **Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES**: **Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS**: **Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS**: **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 35 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL

# NO-DISEASE

## BENOMYL FUNGICIDE

### Wettable Powder

| | |
|---|---|
| **ACTIVE INGREDIENT** | |
| **Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate]** | **50%** |
| **INERT INGREDIENTS** | **50%** |

U.S. Pat. 3,541,213 & 3,631,176 EPA Est. 1352-WV-1 EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN

Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing. Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

## NET 50 LBS.

B-21150 B-73A Made in U.S.A. Printed in U.S.A.

## KILL-DEAD CHEMICALS

Chemical City, West Virginia

**PECANS**: **Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may be added to the spray to improve wetting of foliage. Apply at prepollination when young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE**: **Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. per 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thorough wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES**: Apply 150 to 400 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom; apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 weeks after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by Rhizopus spp. and Alternaria spp.

**STRAWBERRIES**: **Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Leaf Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue at 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acre when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS**: **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals as needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII)**: **Pineapple Disease (Ceratocystis paradoxa)**—Apply to cut seedpieces either as a cold dip or hot dip.

Cold Dip—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to give thorough wetting; remove and allow to drain.

Hot Dip—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of the dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES** (Powdery Mildew, Black Spot); **FLOWERS, ORNAMENTALS** (Powdery Mildew, Botrytis Gray Mold): Field and Greenhouse—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, use 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-day intervals throughout the growing season; shorten interval during humid, rainy weather. Addition of a surfactant to the spray mixture enhances curative action of the fungicide, and improves distribution of the spray on hard-to-wet plants such as roses.

**BULBS** (Easter Lily, Tulip, Gladiolus, Daffodil, Iris): Fusarium and Penicillium Rots—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak cleaned bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hours after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bulbs have been heat-cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

ASSIGNMENT SHEET #1

# Anti-Weed

# 20G

SAMPLE LABEL

## Herbicide

FOR WEED CONTROL IN CORN

Active Ingredients:
Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . 20.0%

| | |
|---|---|
| Inert Ingredients: | 80.0% |
| Total: | 100.0% |

Anti-Weed 20G is a granular herbicide

**Warning:**

Keep out of reach of children. See additional warning statements on back of bag.

**50**
**Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

**KILL-DEAD**
**Chemical Company**
Chemical City, West Virginia

# ASSIGNMENT SHEET #1

## DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

**IMPORTANT:** Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

### Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of **Kill-Dead** or the Seller. All such risks shall be assumed by the Buyer.

**Kill-Dead** warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks referred to above. **Kill-Dead** **makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty.** In no case shall **Kill-Dead** or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. **Kill-Dead** and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of **Kill-Dead** Chemical Company.

### General Information

**Anti-Weed** will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since **Anti-Weed** acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

**Anti-Weed** is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using **Anti-Weed** where adjacent desirable trees, shrubs or plants might be injured.

Store **Anti-Weed** in a dry place.

### Application Instructions

Broadcast or Overall Treatment

Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment

Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \begin{array}{l}\text{Recommended}\\ \text{Broadcast Rate}\end{array} = \begin{array}{l}\text{lbs./Acre}\\ \text{Anti-Weed}\\ \text{for Band}\\ \text{Treatment}\end{array}$$

**Range of Rates:** In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

### Directions for Use

**Anti-Weed** controls most annual broadleaf and grass weeds such as:

Giant Foxtail
Green Foxtail
Yellow Foxtail
Barnyardgrass
(Watergrass)
Crabgrass

Fall Panicum
Annual Morningglory
Cocklebur
Sandbur
Jimsonweed
Lambsquarters

Mustard
Pigweed
Ragweed
Smartweed
Sunflower
Velvetleaf

**Anti-Weed** will not control perennial weeds such as:

Johnsongrass Field Bindweed Canada Thistle Bull Nettle

Apply **Anti-Weed** at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| **Soil** | **Rate per acre of** Anti-Weed **Broadcast** |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs. |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–30 lbs. |

*For calculation of band treatment rate, see Application Instructions Section.

** **Anti-Weed** should not be used on high organic soils such as peat and muck.

### Suggestions for Crop Rotations

1) Corn may be replanted at any time following application of **Anti-Weed**. 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions:** 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following **Anti-Weed** application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

### Warning

Keep out of reach of children.

Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.

This product is toxic to fish. Keep out of lakes, ponds and streams.

Do not reuse container. Destroy when empty.

## PESTS
## UNIT II

### ANSWERS TO ASSIGNMENT SHEET

1. a. Insects
   b. Larva
2. a. Plant diseases (fungi)
   b. Parasitic
3. a. Weeds
   b. Both
   c. Annuals

# PESTS
# UNIT II

## TEST

1. Match the terms on the right to the correct definitions. (Definitions are continued on the following page.)

_____a. Any living thing

_____b. Harmful condition which affects plant life

_____c. Unwanted organism

_____d. Organism that lives and feeds in or on another organism

_____e. Small invertebrate animal with three body regions and six jointed legs; may have two, four, or no wings

_____f. One-celled microorganism which causes wilts, cankers, and other plant diseases

_____g. Immature stage of an insect that does not look like an adult insect

_____h. Immature stage of an insect that looks similar to an adult insect

_____i. Small roundworm that feeds on or in plants and animals

_____j. Signal that something is wrong in a plant, such as change in growth habits

_____k. Plant that grows two years, produces seed, and then dies

_____l. Stages in the life development of organisms

_____m. Nonfeeding, usually immobile stage of an insect before becoming an adult

_____n. Animals closely related to insects but with two body regions, eight jointed legs, and no wings

1. Pest
2. Insect
3. Mite, tick, and spider
4. Plant disease
5. Nematode
6. Parasite
7. Life cycle
8. Larva
9. Pupa
10. Nymph
11. Organism
12. Fungus
13. Bacterium
14. Annual
15. Plant disease symptom or sign
16. Vertebrate
17. Perennial
18. Biennial

_____o. Plant that normally lives for more than two years

_____p. Small plant which causes rot, mold, and other plant diseases

_____q. Animal with a bony spinal column

_____r. Plant that grows from seed, produces seed the same year, and then dies

2. List three main groups of pests.

   a.

   b.

   c.

3. List three ways insects may damage crops.

   a.

   b.

   c.

4. List two ways insects affect livestock and man.

   a.

   b.

5. Name two identifying characteristics common to all adult insects.

   a.

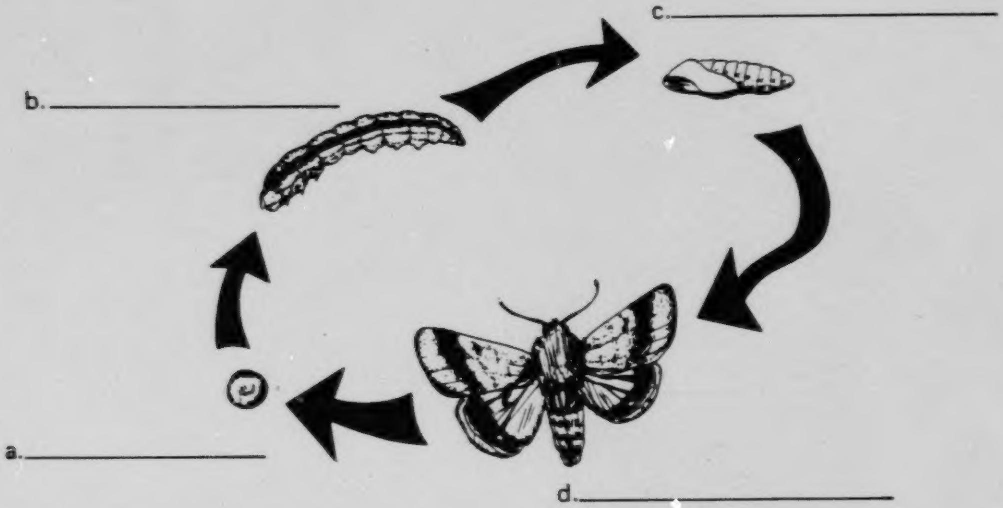
   b.

6. Name two characteristics which aid in distinguishing one insect from another.

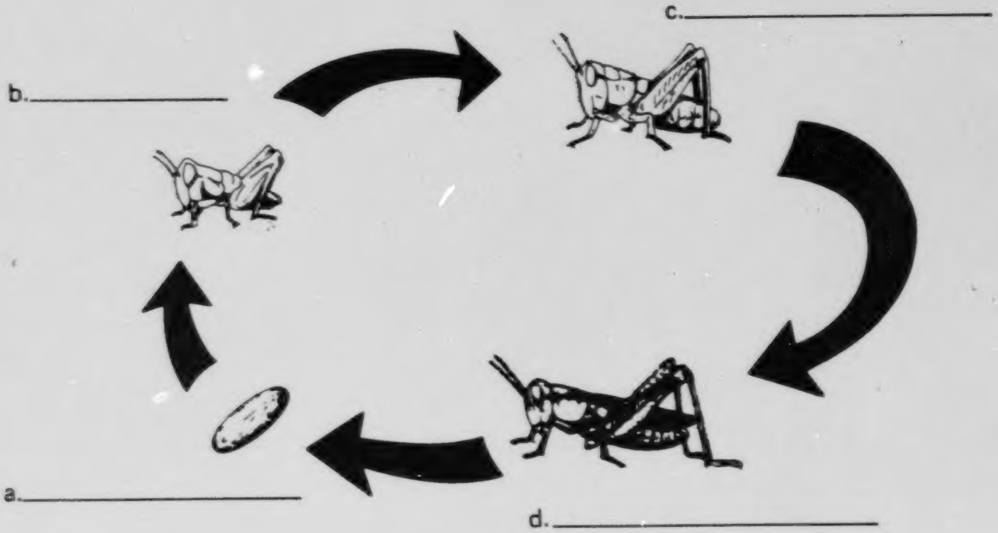
   a.

   b.

7. Identify the four stage life cycle of insects by writing the correct names in the blanks provided.



8. Identify the three stage life cycle of insects by writing the correct names in the blanks provided.



9. Name three identifying characteristics of mites, ticks, and spiders.

a.

b.

c.

10. List three vertebrate pest animals.

a.

b.

c.

11. State the difference between grasses and broadleaf plants.

12. Classify the following plants as annuals (A), biennials (B), or perennials (P) by placing an "A", B", or "P" in front of each plant name.

_____a. Foxtail

_____b. Mullein

_____c. Henbit

_____d. Johnson grass

13. List two main causes of plant diseases.

a.

b.

14. Classify the following causes of plant diseases as parasitic (P) or nonparasitic (N) by placing a "P" or "N" in front of each cause.

_____a. Air pollution

_____b. Chemicals

_____c. Bacteria

_____d. Fungi

15. List four symptoms of plant diseases.

a.

b.

c.

d.

16. Describe symptoms of nematode damage.

17. Name four sources for aid in identifying pests.

a.

b.

c.

d.

18. Interpret the label on the following page to answer the questions below.

a. What type of pests does this pesticide control?

b. When applied at 5# per acre, what types of weeds will this pesticide control?

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (CAUTION)

Harmful if swallowed. Avoid application directly to humans. Care should be taken to avoid inhalation of dust or spray mist, or prolonged contact with skin. In case of contact, immediately flush eyes or skin with large amounts of water. Get medical attention if irritation persists. Wear safety goggles or face shield when handling.

### ENVIRONMENTAL HAZARDS

Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from target area.

## DIRECTIONS FOR USE
## GENERAL CLASSIFICATION

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be disposed of in an incinerator or landfill approved for pesticide containers, or buried in a safe place. Consult Federal, State, or local disposal authorities for approved alternate procedures such as limited open burning.

# DE WEED

HERBICIDE
WETTABLE POWDER

| | |
|---|---|
| ACTIVE INGREDIENT: weedout · tri-azoic acid | 80.0% |
| INERT INGREDIENTS: | 20.0% |
| TOTAL: | 100.0% |

## KEEP OUT OF REACH OF CHILDREN

## CAUTION

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED Induce vomiting
IF INHALED Remove to fresh air
IF IN EYES Flush eyes with plenty of water
IF ON SKIN Remove clothing and wash with detergent and water.

MFG BY A-Z CHEMICALS
Aster, Minnesota

EPA ESTABLISHMENT NO. 1357-MN-1
EPA REGISTRATION NO. 1357-41

## DIRECTIONS FOR USE
## CONTINUED

DeWeed is for weed control in certain crops, ornamental plantings, on industrial sites, and around-the-farm. It should be applied before weeds emerge or following removal of weed growth. It controls a wide variety of annual broadleaf and grass weeds when used at selective rates in agricultural crops and ornamental plantings. When used at higher, non-selective rates in non crop areas, it also controls many perennial broadleaf and grass weeds.

GROUND APPLICATION: Use conventional spray equipment with 80° flat-fan nozzles. Screens in spray system should be no finer than 50 mesh. Use a pump with capacity to maintain 30-40 psi at nozzles. Use hydraulic or mechanical agitation during mixing and application to maintain a uniform suspension. Aerial application: Use only where specified in the use directions.

BLUEBERRIES and CANEBERRIES (blackberries, boysenberries, loganberries, raspberries)—Quackgrass. Apply 5 lbs per acre in the fall or split the application applying 2½ lbs per acre in the fall plus 2½ lbs per acre in the spring, when quackgrass is growing. Do not apply when fruit is present.

ALFALFA—Pure alfalfa less than one year old (Northeastern U.S. only)—Henbit, wild mustard, chickweed, [illegible], downy brome, wild oats, and pepperweed. Pure alfalfa which has been seeded in the spring (before June 1) may be treated in the fall after the last cutting but before frozen ground conditions. Apply 1 lb. of DeWeed per acre. For ground application apply in a minimum of 2½ gals. of water per acre.

GRASSES GROWN FOR SEED (Pacific Northwest only). Perennial ryegrass, tall fescue and fine fescues, such as Pennlawn, Chewings, Rainier, and related species. Control of broadleaf weeds and annual grasses including annual ryegrass, rattail fescue, silver hairgrass and downy brome. Apply 2½ lbs of DeWeed in a minimum of 15 gals of water per acre as soon as fall rains start. Apply only to grasses from which at least one seed crop has been cut.

WEED CONTROL on industrial sites, highway medians, and shoulders, railroad rights-of-way, lumber yards, and in non-crop areas on farms such as around buildings, fuel storage areas, along fences, roadsides, and tanks. Aerial application may be made where it is feasible. Use at least 1 gal of water for each 1 lb. of DeWeed; use more water if practical for both ground and aerial application. To control annual broadleaf and grass weeds (including barnyard grass, cheat, crabgrass, lambsquarters, foxtail, ragweed, puncturevine and mullein), apply 6-12½ lbs. per acre. To control most annual and many perennial broadleaf and grass weeds (including quackgrass, bluegrass, redtop, burdock, Canada thistle, orchardgrass, dogfennel, and plantain), apply 12½-25 lbs. per acre. To control hard-to-kill perennial weeds (including bull thistle and sow thistle), apply 25-50 lbs. per acre.

NET WEIGHT FIVE POUNDS

# PESTS
# UNIT II

## ANSWERS TO TEST

1. 
   a. 11
   b. 4
   c. 1
   d. 6
   e. 2
   f. 13
   g. 8
   h. 10
   i. 5
   j. 15
   k. 18
   l. 7
   m. 9
   n. 3
   o. 17
   p. 12
   q. 16
   r. 14

2. Any three of the following:
   a. Insects
   b. Mites, ticks, and spiders
   c. Plant diseases
   d. Nematodes
   e. Vertebrate animals
   f. Weeds

3. Any three of the following:
   a. Feed on foliage, seeds, fruits, and other plant parts
   b. Tunnel or bore into stems, stalks, and branches
   c. Feed on and tunnel in roots
   d. Suck the sap from leaves, stems, and branches
   e. Carry plant disease agents

4. Any two of the following:
   a. Blood sucking
   b. Direct attack and spread of disease organisms
   c. Living on or in the animal
   d. Contaminating agricultural products

5. a. Six jointed legs

   b. Three body regions

6. a. Wings

   b. Mouthparts

7. a. Egg

   b. Larva

   c. Pupa

   d. Adult

8. a. Egg

   b. Nymph

   c. Nymph

   d. Adult

9. a. Eight jointed legs

   b. Two body regions

   c. No wings

10. Any three of the following:

    a. Birds

    b. Mammals

    c. Fish

    d. Reptiles

    e. Amphibians

11. a. Grasses have long narrow leaves and parallel veins

    b. Broadleaf plants have wide, flat leaves and netted veins

12. a. A c. A

    b. B d. P

13. a. Nonparasitic

    b. Parasitic

14. a. N c. P

b. N d. P

15. Any four of the following:

- a. Decaying or rotting
- b. Abnormal growth
- c. Underdevelopment or stunting
- d. Wilting
- e. Discoloration

16. Description should include:

- a. Similar to plant disease symptoms on plant parts above ground
- b. Swollen and misshapen roots and sometimes galls

17. a. Vocational agriculture instructor

- b. County extension agent
- c. Pesticide dealer or representative
- d. Land grant or other universities

18. a. Weeds

- b. Annual broadleaf and grass weeds

# ENVIRONMENTAL PROTECTION
## UNIT III

## TERMINAL OBJECTIVE

After completion of this unit, the student should be able to discuss reasons for protecting the environment, select from a list the ways pesticides aid in making the environment better, and interpret pesticide labels. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

## SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with pesticides and environmental protection to the correct definitions.
2. List resources necessary for man to exist.
3. Discuss in a short paragraph the reasons for protecting the environment.
4. Select from a list ways pesticides help the environment.
5. List ways improper use of pesticides can harm the environment.
6. Explain in a short paragraph how pesticides may disrupt the food chain or food web.
7. Match the classifications of pesticides according to buildup to the correct definitions.
8. List things the applicator must consider before applying a pesticide on or near desirable plants and animals.
9. Name the major ways by which pesticides accumulate.
10. List means by which pesticides pollute streams, ponds, and water systems.
11. Discuss in a short paragraph ways pesticides may aid the target pest instead of controlling it.
12. Interpret pesticide labels correctly when given questions on environmental protection and labels.

# ENVIRONMENTAL PROTECTION
# UNIT III

## SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide student with objective sheet.

  B. Provide student with information and assignment sheets.

  C. Make transparencies.

  D. Discuss terminal and specific objectives.

  E. Discuss information and assignment sheets.

  (NOTE: Instructors may want to provide additional assignment sheets using labels common to the community.)

  F. Ask students to clip magazine and newspaper articles which demonstrate ways that pesticides improve the environment and to list other ways.

  G. Give test.

II. Student:

  A. Read the objective sheet.

  B. Read and study information sheet.

  C. Complete assignment sheets.

  D. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

  A. TM 1--Food Chain or Food Web

  B. TM 2--First Overlay

  C. TM 3--Second Overlay

D. TM 4--Third Overlay

E. TM 5--Accumulation of Pesticides

F. TM 6--First Overlay

G. TM 7--Second Overlay

H. TM 8--Pollution by Pesticides

IV. Assignment sheets

A. Assignment Sheet #1--Draw a Food Chain or Food Web Using Farm Animals

B. Assignment Sheet #2--Interpret Pesticide Labels

V. Answers to assignment sheets

# ENVIRONMENTAL PROTECTION
## UNIT III

## INFORMATION SHEET

I. Terms and definitions

   A. Environment--Surroundings such as water, air, soil, plants, and animals

   B. Ecology--Study of the relationship between a plant or animal and its surroundings

   C. Food chain or food web--Way of describing how all animals depend on others for food

   (NOTE: It is the relationship among plants, plant-eaters, and meat-eaters.)

   D. Phytotoxicity--Causing injury to plant life; poisonous to plant life

   E. Vaporization--Process of becoming a gas

   F. Drift--Movement of pesticide droplets or particles by wind and air currents

   G. Target--Area, building, plant, animal, or pest intended to be treated with pesticide

   H. Residue--Amount of pesticide that remains on or in a crop or animal or on a surface following application

II. Resources necessary for man to exist

(NOTE: The surroundings in which man lives and the resources he depends on make up his environment.)

   A. Place to live

   B. Clean water

   C. Clean air

   D. Food

   E. Clean soil

III. Reasons for protecting the environment

   A. Clean water is essential for man and animal

   B. Clean soil is necessary to grow crops

   C. Clean air to breathe is essential

D. Bees and other pollinators must be protected

E. Wildlife is essential for a balance of nature

F. Recreational areas are desirable for man

IV. Ways pesticides help environment

A. Control pests

B. Enable more food to be produced on same area

C. Control plant diseases, parasites, and insects

D. Control animal diseases, parasites, and insects

E. Preserve outdoor activities

V. Ways improper use of pesticides harm the environment

A. Cause nature imbalance

B. Pollute streams and water supply

C. Pollute crops

D. Pollute soil

E. Injure desirable plants

F. Residue in meat animals

VI. How pesticides may disrupt a food chain or food web (Transparency 1, Assignment Sheet #1)

A. Each animal has a place in a food chain or food web, depending on the type of food it eats

1. Animals that eat only plants are on the lowest level

2. Animals which eat plants and animals, including insects, are on the next level

3. Animals that eat only meat are on the top level

B. Meat eaters may be harmed by pesticides by eating other animals that have accumulated pesticides in their bodies

(NOTE: Animals do not have to directly contact the pesticide spray or application for it to cause harm.)

C. When plants or animals, including insects, in the lower level of a food chain or food web are killed by pesticides, animals in levels above them may starve

VII. Classifications of pesticides according to buildup

A. Accumulative--Pesticide that can collect and build up in the body of an animal or plant when the animal or plant is repeatedly exposed

(NOTE: This pesticide does not readily break down; it may build up in an animal's body until it becomes harmful.)

B. Nonaccumulative--Pesticide that does not collect and build up in the body of an animal or plant even when the animal or plant is repeatedly exposed

(NOTE: This chemical may or may not break down rapidly into other relatively harmless materials.)

C. Persistent--Pesticide that stays in the environment for a rather long period of time

(NOTE: This chemical does not necessarily build up but can be harmful. For example, atrazine in the soil does not harm animals or wildlife but does restrict growth of certain plants for a long time after application.)

D. Nonpersistent--Pesticide that does not stay in the environment for a long period of time

(NOTE: This chemical breaks down into relatively harmless materials.)

VIII. Things applicator must consider before applying pesticide on or near desirable plants and animals

A. Type of pesticide

(NOTE: Herbicides may be especially hazardous to desirable plants.)

B. Movement

(NOTE: Movement may include drift, runoff, erosion, leaching, and vaporization.)

C. Weather conditions

(NOTE: Weather conditions may include soil moisture, rain, humidity, temperature, and light.)

D. Form of pesticide

(NOTE: Granules and low pressure sprays are less likely to move off target than dusts and high pressure sprays.)

E. Proper dosage

(NOTE: Overdosing may cause phytotoxicity even when proper doses will not.)

F. Persistence

(NOTE: Persistent pesticides may affect future plants to be grown in that area.)

G. Type of pesticide used previously in the sprayer

(NOTE: Even very small amounts of some herbicides which may remain in the sprayer can cause phytotoxicity on sensitive plants.)

(CAUTION: Before applying any pesticide, READ THE LABEL AND FOLLOW DIRECTIONS.)

IX. Major ways pesticides accumulate (Transparencies 2, 3, 4, and 5)

A. Through a food chain when animals eat plants or other animals

B. By building up to high levels over a period of time when taken in directly and stored in the animal

X. Means by which pesticides pollute streams, ponds, and water systems (Transparencies 6, 7, and 8)

A. Overdose and overuse

B. Runoff by irrigation

C. Runoff caused by rain

D. Drift and vaporization

E. Carelessness

F. Improper disposal of containers

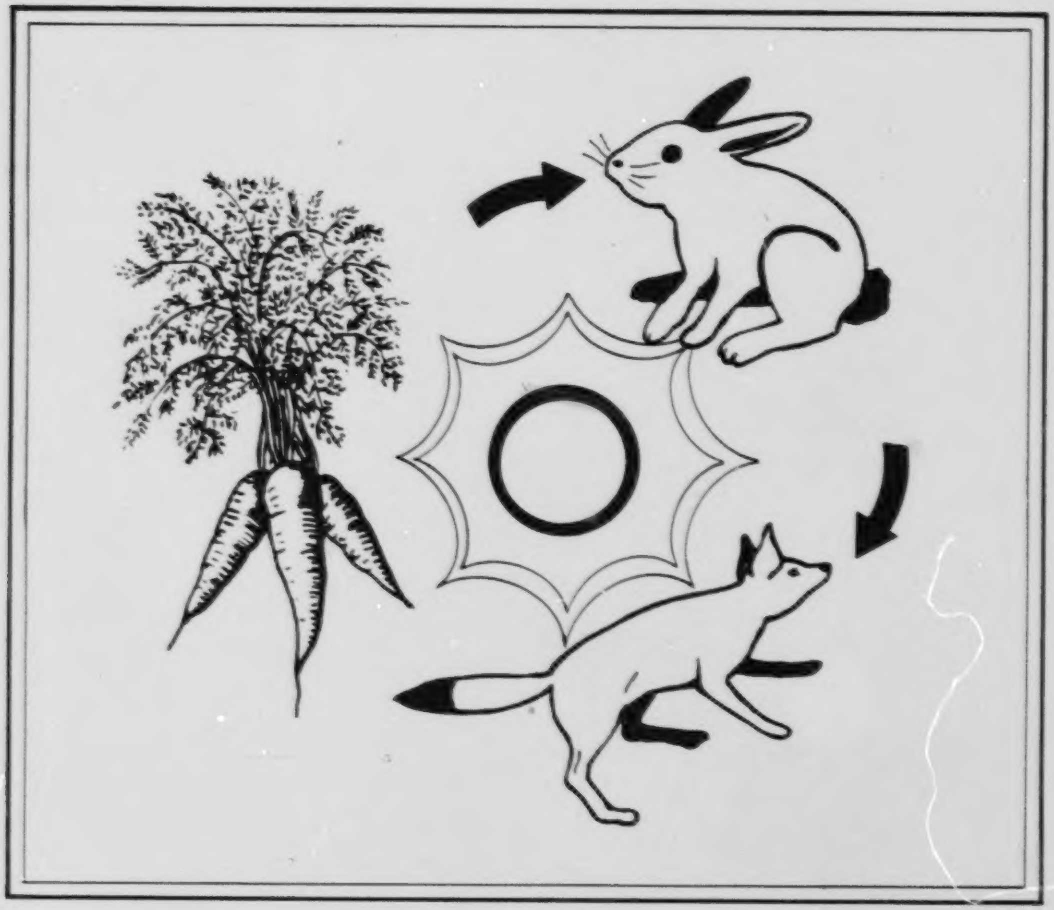
G. Improper disposal of unused chemicals

XI. Ways pesticide may aid target pest instead of controlling it

A. Death of natural enemy

B. Resistance to chemical

# Food Chain or Food Web



# First Overlay

Pesticide on Fruit

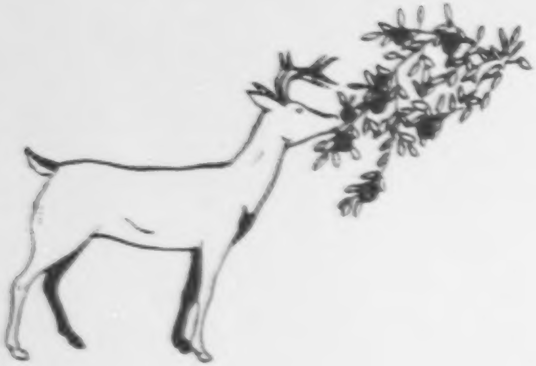
# Second Overlay

Weeks Later - Residue

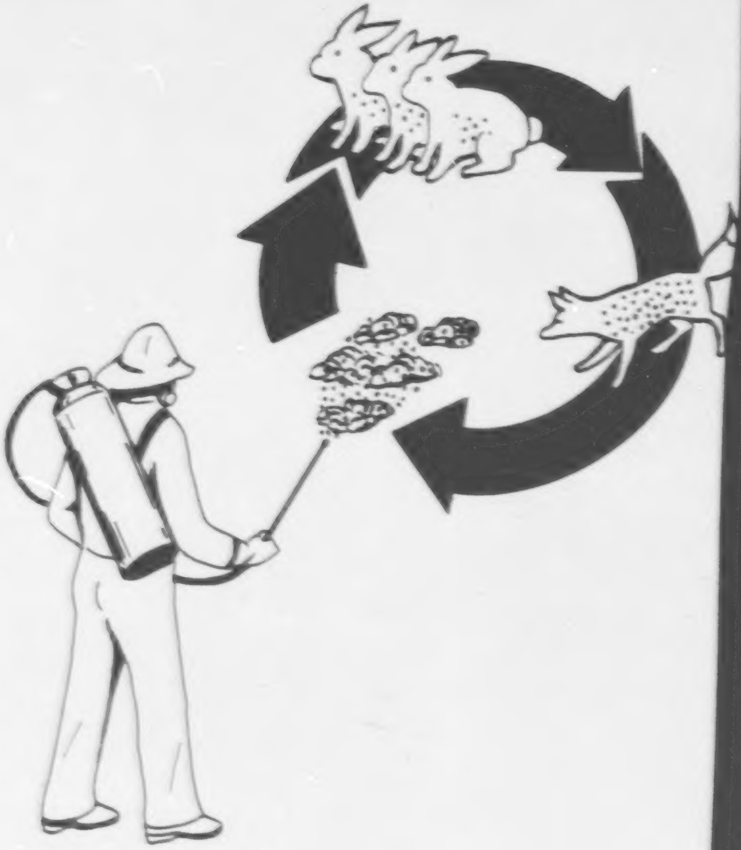
# Third Overlay

Months Later -
Possible Toxic Amount

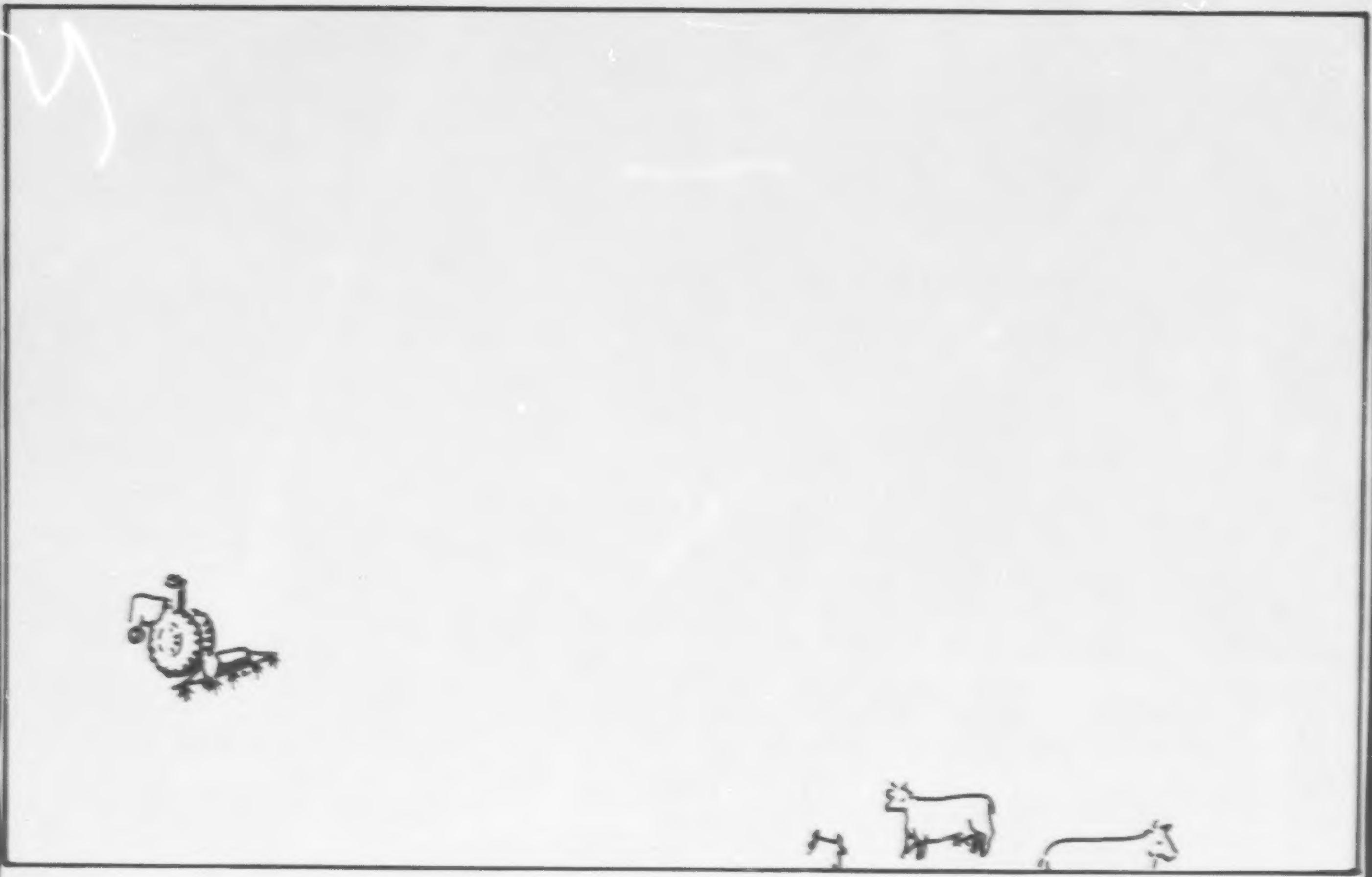
# Accumulation of Pesticides



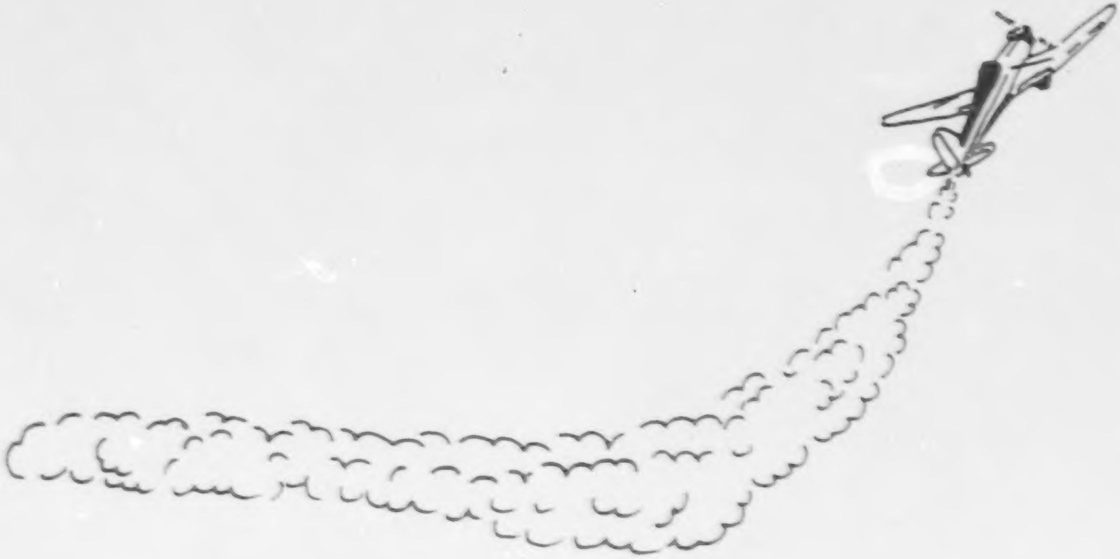
Pesticide on Fruit Trees



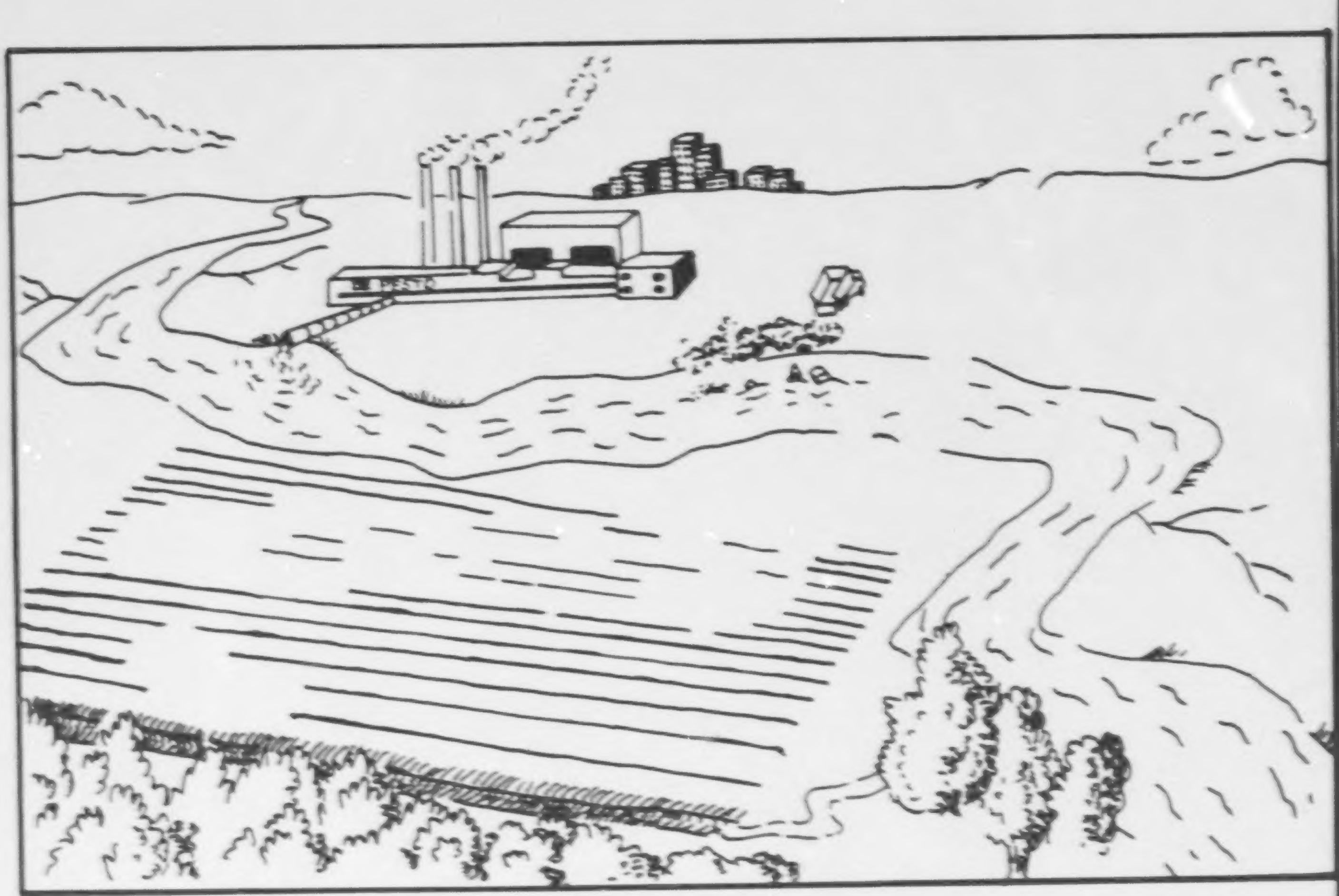
# First Overlay



# Second Overlay



# Pollution by Pesticides



# ENVIRONMENTAL PROTECTION
## UNIT III

## ASSIGNMENT SHEET #1--DRAW A FOOD CHAIN OR FOOD WEB USING FARM ANIMALS

Draw a food chain or food web using crops such as hay, forage, or grain and animals such as cattle, calves, sheep, poultry, hogs, and goats.

# ENVIRONMENTAL PROTECTION
## UNIT III

## ASSIGNMENT SHEET #2--INTERPRET PESTICIDE LABELS

Read the labels provided on the following pages and answer the questions below.

(NOTE: Instructors may want to provide additional assignment sheets using labels common to the community.)

1. Using the De Metho label, answer the questions below.

   a. Is there a potential problem if De Metho is the choice of pesticide and your farm is next to a bird sanctuary or wildlife refuge? Explain your answer.

   b. Would De Metho be a good choice of pesticide if your crops were in full bloom? Explain your answer.

2. Using the Anti-Weed label, answer the questions below.

   a. Is there a potential problem if Anti-Weed is the choice of pesticide and your farm is next to a bird sanctuary or wildlife refuge? Explain your answer.

b. Would Anti-Weed be a good choice of pesticide if your crops were next to sensitive plants such as flowers? Explain your answer.

c. Would Anti-Weed be a good choice of pesticide if you want to plant beans in that field the next year? Why?

d. How would you classify this pesticide using the buildup classification? Mark the blank by the correct answer.

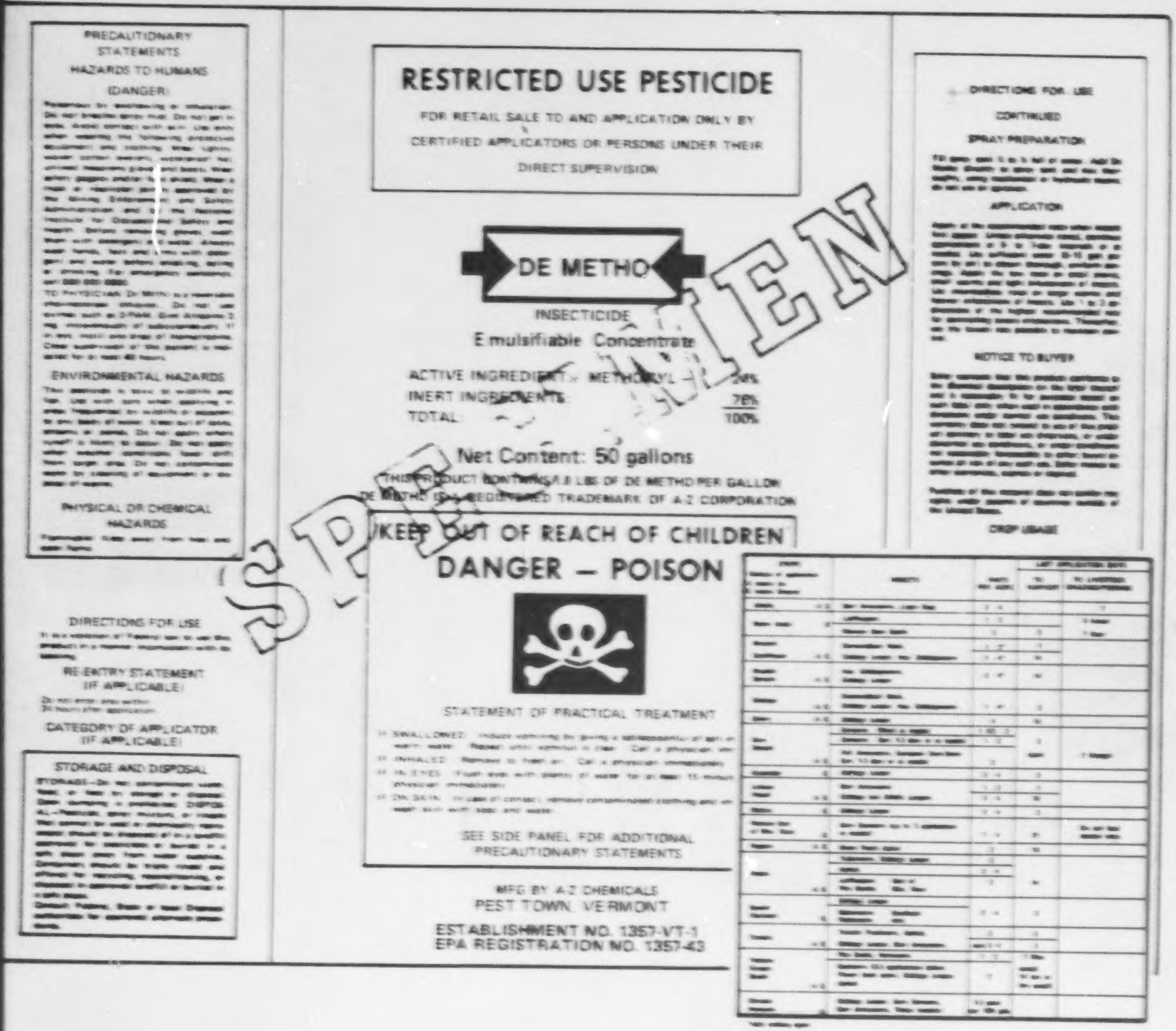
_____1) Persistent

_____2) Nonpersistent

3. Using the No-Disease label, answer the questions below.

a. Is there a potential problem if No-Disease is the choice of pesticide and drift or runoff would likely enter a stream? Explain your answer.

b. Would No-Disease be a good choice of a pesticide if your crops were in full bloom. Explain your answer.



PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS

(DANGER)

ENVIRONMENTAL HAZARDS

PHYSICAL OR CHEMICAL HAZARDS

DIRECTIONS FOR USE

RE-ENTRY STATEMENT (IF APPLICABLE)

CATEGORY OF APPLICATOR (IF APPLICABLE)

STORAGE AND DISPOSAL

**RESTRICTED USE PESTICIDE**

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

**DE METHO**

INSECTICIDE

Emulsifiable Concentrate

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL | 24% |
| INERT INGREDIENTS | 76% |
| TOTAL | 100% |

Net Content: 50 gallons

THIS PRODUCT CONTAINS [illegible] LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

SPECIMEN

**KEEP OUT OF REACH OF CHILDREN**

**DANGER – POISON**

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: [illegible]

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: [illegible]

IF ON SKIN: [illegible]

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

ESTABLISHMENT NO. 1357-VT-1
EPA REGISTRATION NO. 1357-43

DIRECTIONS FOR USE

CONTINUED

SPRAY PREPARATION

APPLICATION

NOTICE TO BUYER

CROP USAGE

ASSIGNMENT SHEET #2

ASSIGNMENT SHEET #2

# Anti-Weed

# 20G

SAMPLE LABEL

**Herbicide**

FOR WEED CONTROL IN CORN

| Active Ingredients: | |
|---|---|
| Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . | 20.0% |
| Inert Ingredients: | 80.0% |
| Total: | 100.0% |

Anti-Weed 20G is a granular herbicide

**Warning:**

Keep out of reach of children. See additional warning statements on back of bag.

**50 Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

**KILL-DEAD**
**Chemical Company**
Chemical City, West Virginia

# ASSIGNMENT SHEET #2

## DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

**IMPORTANT:** Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

### Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of **Kill-Dead** or the Seller. All such risks shall be assumed by the Buyer.

**Kill-Dead** warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks referred to above. **Kill-Dead makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty.** In no case shall **Kill-Dead** or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. **Kill-Dead** and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of **Kill-Dead Chemical Company**.

### General Information

Anti-**Weed** will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since Anti-**Weed** acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

Anti-**Weed** is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using Anti-**Weed** where adjacent desirable trees, shrubs or plants might be injured.

Store Anti-**Weed** in a dry place.

**Application Instructions**
Broadcast or Overall Treatment
Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment
Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \text{Recommended Broadcast Rate} = \begin{array}{l}\text{lbs./Acre}\\ \text{Anti-Weed}\\ \text{for Band}\\ \text{Treatment}\end{array}$$

Range of Rates: In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

### Directions for Use

Anti-**Weed** controls most annual broadleaf and grass weeds such as:

Giant Foxtail
Green Foxtail
Yellow Foxtail
Barnyardgrass
(Watergrass)
Crabgrass

Fall Panicum
Annual Morningglory
Cocklebur
Sandbur
Jimsonweed
Lambsquarters

Mustard
Pigweed
Ragweed
Smartweed
Sunflower
Velvetleaf

Anti-**Weed** will not control perennial weeds such as:

Johnsongrass Field Bindweed Canada Thistle Bull Nettle

Apply Anti-**Weed** at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| **Soil** | **Rate per acre of** Anti-Weed **Broadcast** |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs. |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–<br>30 lbs. |

*For calculation of band treatment rate, see Application Instructions Section.

** Anti-**Weed** should not be used on high organic soils such as peat and muck.

**Suggestions for Crop Rotations**
1) Corn may be replanted at any time following application of Anti-**Weed**. 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions:** 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following Anti-**Weed** application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

### Warning

Keep out of reach of children.

Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.

This product is toxic to fish. Keep out of lakes, ponds and streams.

---

Do not reuse container. Destroy when empty.

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with

**ALMONDS: Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half to full bloom.

**APPLES, PEARS:** Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP): White Mold (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH: Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII): Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES: Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS: Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 35 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL

# NO-DISEASE

**BENOMYL FUNGICIDE**

**Wettable Powder**

| | |
|---|---|
| **ACTIVE INGREDIENT** | |
| Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate] | 50% |
| **INERT INGREDIENTS** | 50% |

U.S. Pat. 3,541,213 & 3,631,176 EPA Est. 1352-WV-1 EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.
Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing.
Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

## NET 50 LBS.

B-21190 B-734 Made in U.S.A. Printed in U.S.A.

## KILL-DEAD CHEMICALS

Chemical City, West Virginia

**PECANS: Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may be added to the spray to improve wetting of foliage. Apply at prepollination when young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE: Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. per 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thorough wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom; apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 weeks after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by Rhizopus spp. and Alternaria spp.

**STRAWBERRIES: Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Leaf Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue at 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acre when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals as needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII): Pineapple Disease (Ceratocystis paradoxa)**—Apply to cut seedpieces either as a cold dip or hot dip.

Cold Dip—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to give thorough wetting; remove and allow to drain.

Hot Dip—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of the dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES (Powdery Mildew, Black Spot); FLOWERS, ORNAMENTALS (Powdery Mildew, Botrytis Gray Mold): Field and Greenhouse**—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, use 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-day intervals throughout the growing season; shorten interval during humid, rainy weather. Addition of a surfactant to the spray mixture enhances curative action of the fungicide, and improves distribution of the spray on hard-to-wet plants such as roses.

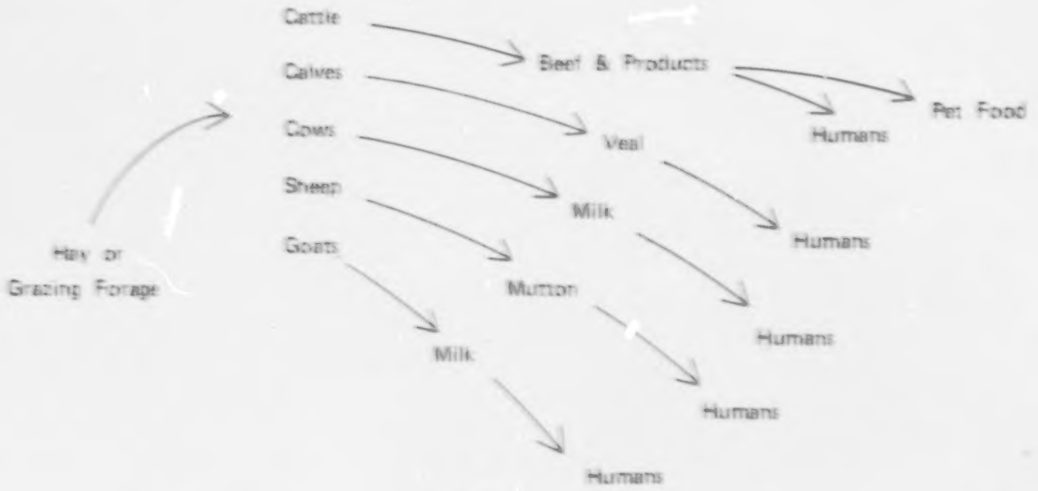
**BULBS (Easter Lily, Tulip, Gladiolus, Daffodil, Iris): Fusarium and Penicillium Rots**—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak cleaned bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hours after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bulbs have been heat-cured.

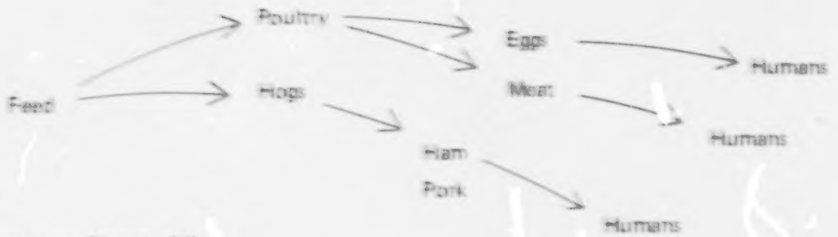
**NOTICE TO BUYER**—Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

## ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1


Cattle
Calves
Cows
Sheep
Goats
Hay or
Grazing Forage
Beef & Products
Pet Food
Humans
Veal
Humans
Milk
Humans
Mutton
Humans
Milk
Humans


Feed
Poultry
Hogs
Eggs
Meat
Humans
Humans
Ham
Pork
Humans

Assignment Sheet #2

1. De Metho

   a. Yes. The environmental hazards statement states that this is toxic to birds and other wildlife and gives warning not to apply where runoff or drift is likely to occur

   b. No. It is toxic to bees and should not be used when bees are actively visiting an area

2. Anti-Weed

   a. No. There is no warning about wildlife hazards

   b. No. Do not apply near desirable plants; it may cause injury

    c. No. Anti-Weed is a persistent pesticide. For certain crops, including beans, it would be likely that injury would occur if planted the next year on treated soil

    d. Persistent

3. No-Disease

    a. Yes. No-Disease is toxic to fish. Keep out of lakes, streams, and ponds

    b. Yes. There is no statement concerning bee hazards

# ENVIRONMENTAL PROTECTION
# UNIT III

## TEST

1. Match the terms on the right to the correct definitions.

_____a. Amount of pesticide that remains on or in a crop or animal or on a surface following application

_____b. Movement of pesticide droplets or particles by wind and air currents

_____c. Way of describing how all animals depend on others for food

_____d. Area, building, plant, animal, or pest intended to be treated with pesticide

_____e. Causing injury to plant life; poisonous to plant life

_____f. Study of the relationship between a plant or animal and its surroundings

_____g. Surroundings such as water, air, soil, plants, and animals

_____h. Process of becoming a gas

1. Residue
2. Phytotoxicity
3. Target
4. Ecology
5. Drift
6. Environment
7. Food chain or food web
8. Vaporization

2. List three resources necessary for man to exist.

a.

b.

c.

3. Discuss in a short paragraph the reasons for protecting the environment.

4. Select from the list below ways pesticides help the environment by placing an "X" in the blanks.

_____a. Kill all insects

_____b. Control pests

_____c. Enable more food to be produced on same area

_____d. Control plant diseases, parasites, and insects

_____e. Kill fish

_____f. Control animal diseases, parasites, and insects

5. List two ways improper use of pesticides can harm the environment.

a.

b.

6. Explain in a short paragraph how pesticides may disrupt the food chain or food web.

7. Match the classifications of pesticides on the right to the correct definitions.

_____a. Pesticide that stays in the environment for a rather long period of time

_____b. Pesticide that does not collect and build up in the body of an animal or plant even when the animal or plant is repeatedly exposed

_____c. Pesticide that can collect and build up in the body of an animal or plant when the animal or plant is repeatedly exposed

_____d. Pesticide that does not stay in the environment for a long period of time

1. Accumulative
2. Persistent
3. Nonaccumulative
4. Nonpersistent

8. List three things the applicator must consider before applying a pesticide on or near desirable plants and animals.

a.

b.

c.

9. Name the two major ways pesticides accumulate.

a.

b.

10. List three means by which pesticides pollute streams, ponds, and water systems.

a.

b.

c.

11. Discuss in a short paragraph ways pesticide may aid the target pest instead of controlling it.

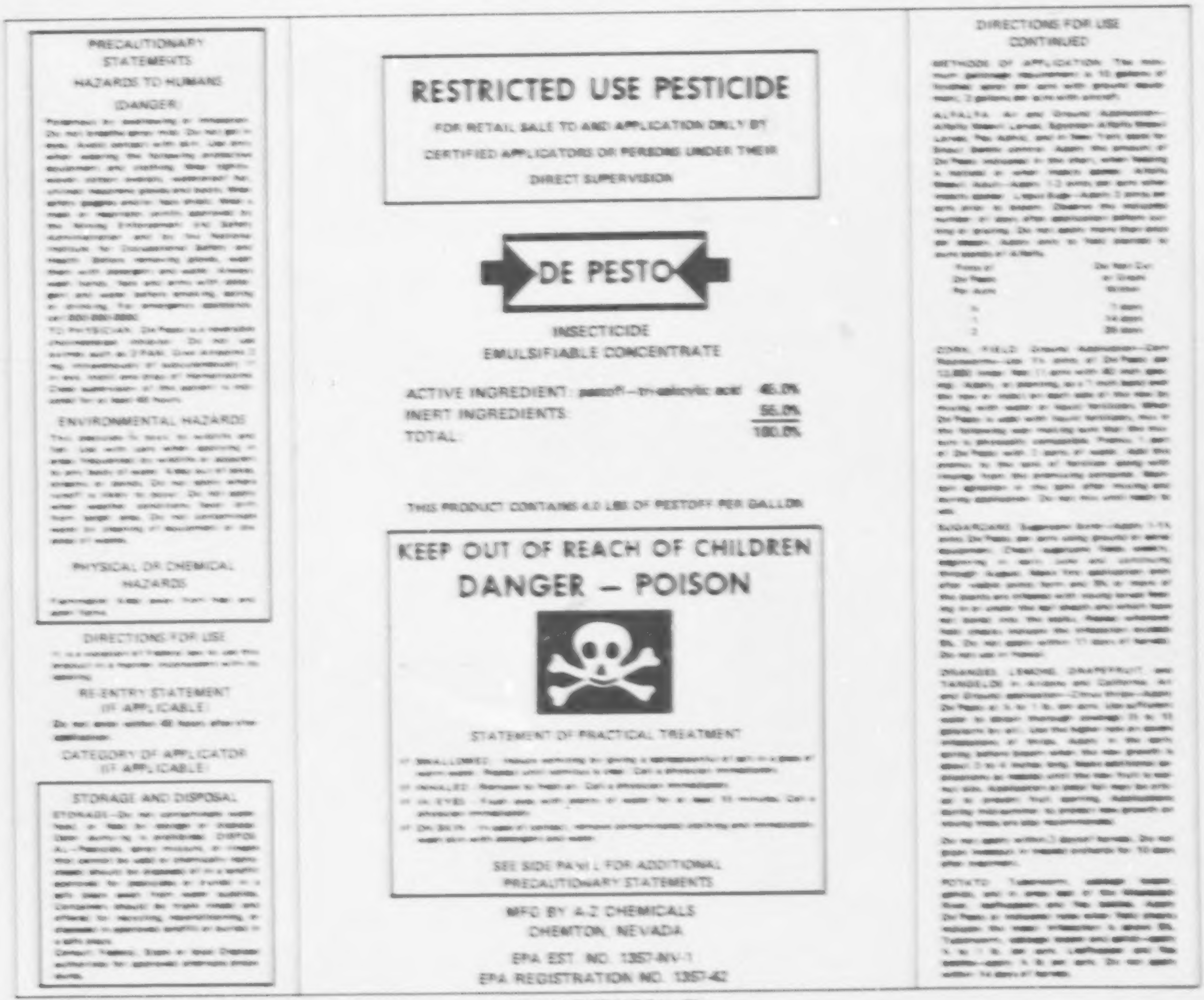
12. Interpret the label below by answering the following questions.

a. Is there a potential problem if De Pesto is the choice of pesticide and you wish to spray near a wooded area used as a nesting site for many game birds?

_____YES _____NO Why?

b. Is there a potential problem if De Pesto is the choice of pesticide to use on the slopes which drain into your farm pond or local stream?

_____YES _____NO Why?



PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS

(DANGER)

ENVIRONMENTAL HAZARDS

PHYSICAL OR CHEMICAL HAZARDS

DIRECTIONS FOR USE

RE-ENTRY STATEMENT (IF APPLICABLE)

CATEGORY OF APPLICATOR (IF APPLICABLE)

STORAGE AND DISPOSAL

**RESTRICTED USE PESTICIDE**

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

**DE PESTO**

INSECTICIDE
EMULSIFIABLE CONCENTRATE

| | |
|---|---|
| ACTIVE INGREDIENT: pestoff—tri-salicylic acid | 45.0% |
| INERT INGREDIENTS | 55.0% |
| TOTAL | 100.0% |

THIS PRODUCT CONTAINS 4.0 LBS OF PESTOFF PER GALLON

**KEEP OUT OF REACH OF CHILDREN**

**DANGER — POISON**

STATEMENT OF PRACTICAL TREATMENT

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
CHEMTON, NEVADA

EPA EST. NO. 1357-NV-1
EPA REGISTRATION NO. 1357-42

NET CONTENTS ONE GALLON

DIRECTIONS FOR USE CONTINUED

# ENVIRONMENTAL PROTECTION
# UNIT III

## ANSWERS TO TEST

1. a. 1
   b. 5
   c. 7
   d. 3
   e. 2
   f. 4
   g. 6
   h. 8

2. Any three of the following:
   a. Place to live
   b. Clean water
   c. Clean air
   d. Food
   e. Clean soil

3. Discussion should include:
   a. Clean water is essential for man and animal
   b. Clean soil is necessary to grow crops
   c. Clean air to breathe is essential
   d. Bees and other pollinators must be protected
   e. Wildlife is essential for a balance of nature
   f. Recreational areas are desirable for man

4. b, c, d, f

5. Any two of the following:
   a. Cause nature imbalance
   b. Pollute streams and water supply
   c. Pollute crops
   d. Pollute soil
   e. Injure desirable plants
   f. Residue in meat animals

6. Explanation should include:

   a. Each animal has a place in a food chain or food web, depending on the type of food it eats

      1) Animals that eat only plants are on the lowest level

      2) Animals which eat plants and animals, including insects, are on the next level

      3) Animals that eat only meat are on the top level

   b. Meat eaters may be harmed by pesticides by eating other animals that have accumulated pesticides in their bodies

   c. When plants or animals, including insects, in the lower level of the food chain or food web are killed by pesticides, animals in levels above them may starve

7. a. 2 c. 1

   b. 3 d. 4

8. Any three of the following:

   a. Type of pesticide

   b. Movement

   c. Weather conditions

   d. Form of pesticide

   e. Proper dosage

   f. Persistence

   g. Type of pesticide used previously in the sprayer

9. a. Through a food chain when animals eat plants or other animals

   b. By building up to high levels over a period of time when taken in directly and stored in the animal

10. Any three of the following:

   a. Overdose and overuse

   b. Runoff by irrigation

   c. Runoff caused by rain

   d. Drift and vaporization

    e. Carelessness
    f. Improper disposal of containers
    g. Improper disposal of unused chemicals

11. Discussion should include:
    a. Death of natural enemy
    b. Resistance to chemical

12. a. Yes. This pesticide is toxic to wildlife
    b. Yes. This pesticide is toxic to fish

# PESTICIDES
## UNIT IV

## TERMINAL OBJECTIVE

After completion of this unit, the student should be able to match the ways pesticides attack pests to the best method of application; describe situations where short-term, residual, and broad spectrum insecticides and nonselective and selective herbicides should be used; and explain why timing of a pesticide application is important. The student should be able to name factors to consider in good pest control, list factors an applicator must consider when choosing the pesticide, and interpret pesticide labels. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

## SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with pesticides to the correct definitions.
2. Match the ways pesticides attack pests to the best method of application.
3. Describe a situation where short-term (nonpersistent) insecticides are often used.
4. Describe a situation where residual (persistent) insecticides are often used.
5. Describe a situation where broad spectrum (nonselective) insecticides are often used.
6. Distinguish between protectant or preventive pesticides and eradicant pesticides.
7. Describe a situation where a nonselective herbicide would be used.
8. Describe a situation where a selective herbicide would be used.
9. State the differences between preplanting, preemergence, and postemergence.
10. Explain why timing of a pesticide application is important.
11. List types of chemicals used to alter or change normal crop growth processes.
12. List climatic factors affecting pesticide application.
13. List factors an applicator must consider when choosing the appropriate pesticide.
14. Name conditions that may make control of a pest unnecessary.

15. Name factors to consider in good pest control.

16. Match pest control methods to the proper descriptions.

17. Define integrated control.

18. Interpret pesticide labels correctly when given questions on pesticides.

# PESTICIDES
## UNIT IV

## SUGGESTED ACTIVITIES

I. Instructor:

   A. Provide student with objective sheet.

   B. Provide student with information and assignment sheets.

   C. Make transparencies

   D. Discuss terminal and specific objectives.

   E. Discuss information and assignment sheets.

   F. Ask students to list the pesticides on their farms and in their homes. Have them list them according to type, such as insecticide or herbicide.

   G. Invite local pest management specialist to speak to class about ongoing projects. Ask the specialist to bring examples of natural enemies and beneficial plants and animals found in your area.

   H. Give test.

II. Student:

   A. Read objective sheet.

   B. Study information sheet and take notes.

   C. Complete assignment sheet.

   D. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

   A. TM 1--Ways Pesticides Attack Pests

   B. TM 2--Selective vs Nonselective Herbicide

   C. TM 3--Preemergence and Postemergence

    - D. TM 4--Chemicals Which Alter or Change Normal Plant Growth
    - E. TM 5--Alternate Control Methods
    - F. TM 6--Integrated Control

IV. Assignment sheet #1--Interpret Pesticide Labels

V. Answers to assignment sheet

VI. Test

VII. Answers to test

# PESTICIDES
## UNIT IV

## INFORMATION SHEET

I. Terms and definitions

A. Pesticide--Chemical or other substance that will destroy or control a pest or protect something from a pest

B. Stomach poison--Pesticide which kills when swallowed

C. Fumigant poison--Pesticide which enters the pest in the form of a gas and kills it

D. Contact poison--Pesticide which kills when it touches or is touched by the pest

E. Systemic--Pesticide that is taken up by one part of a plant or animal and moved to another section where it acts against a pest

F. Short-term (nonpersistent)--Pesticide that breaks down almost immediately into nontoxic by-products

G. Residual (persistent)--Pesticide that remains in the environment for a fairly long time

H. Broad spectrum (nonselective)--Pesticide which is toxic to a wide range of pests; used when several different pests are a problem

(NOTE: *Short term*, *residual*, and *broad spectrum* are often used in describing insecticides and miticides.)

I. Surface spray--Pesticide spray which is evenly applied to the outside of the object to be protected

J. Selective--Pesticide which is more toxic to some types of plants or animals than to others; usually used to describe a particular type of pesticide

Example: A selective herbicide would kill crabgrass in a cornfield but would not injure the corn

K. Nonselective--Pesticide which is toxic to all or most plants or animals of a type; usually used to describe a particular type of pesticide

Example: A nonselective herbicide would kill or injure all plants in the application site but not all insects, animals, or other organisms

L. Protectant (preventive)--Pesticide applied before pests are actually found but where they are expected

M. Eradicant--Pesticide which kills the pest after it appears

N. Preplant--Pesticide used before the crop is planted

O. Preemergence--Pesticide used before crop or weeds appear; may also refer to use after crop emerges or is established but before weeds emerge

P. Postemergence--Pesticide used after crop or weeds have appeared

Q. Desiccant--Pesticide which draws moisture from or dries up a plant, plant part, or insect causing it to die

R. Defoliant--Pesticide which causes the leaves of a plant to drop off

S. Antitranspirant--Chemical which coats the leaves of plants to reduce water loss

T. Growth regulator--Pesticide which increases, decreases, or changes the normal growth of a plant

U. Herbicide--Pesticide used to control unwanted plants

V. Fungicide--Pesticide used to control fungi which cause molds, rots, and other plant diseases

W. Rodenticide--Pesticide used to control rodents such as rats and mice

X. Nematicide--Pesticide used to control nematodes

Y. Miticide--Pesticide used to control mites

Z. Insecticide--Pesticide used to control insects

II. Ways pesticides attack pests and methods of application (Transparency 1)

A. Stomach poison

1. Used as a bait, surface spray, or dust

2. Must be eaten by the pest

B. Contact poison

1. Used as a surface spray, dust, or in soil incorporation

2. Must touch or be touched by the pest

C. Systemic poison--Used as a surface or foliar spray, pour-on, injection, or granule

# INFORMATION SHEET

D. Fumigant poison--Applied as a gas or as a liquid which then vaporizes

(NOTE: A pesticide may kill the pest by touching it or it may have to be swallowed to be effective. Some pesticides kill by being both touched and swallowed. Systemics may be absorbed, injected, or fed into the plant or animal to be protected. When the pest feeds on this plant or animal, it eats the systemic chemical and is killed.)

III. Situations where short-term (nonpersistent) insecticides are often used

A. Insects do not return

B. Long-term exposure could injure nontarget plants or animals

C. Short time until harvest of food crop

D. Short time until slaughter of livestock or poultry

E. In homes and dwellings where people and domestic animals might be exposed

IV. Situations where residual (persistent) insecticides are often used

A. Insects are constant control problem and there will be no environmental hazard

B. Fly control in livestock buildings

C. Soil pesticides

V. Situations where broad spectrum (nonselective) insecticides are often used

A. General purpose or wide range killing

B. Presence of several different kinds of insects

(NOTE: Usually broad spectrum insecticides do not kill all insects; each one varies on the kinds and numbers of insects it controls.)

VI. Protectant versus eradicant pesticides

(NOTE: Usually these terms are associated with fungicide use.)

A. Protectant or preventive--Fungicide designed to prevent the plant from getting the disease

(NOTE: It is applied before the disease gets a start and is very useful when a particular disease or group of diseases are likely to attack a plant or crop year after year. Protectants have often been used as routine precautions on fruit and vegetable crops.)

B. Eradicant--Fungicide which kills the disease after it appears in or on the plant

(NOTE: Eradicants are less common than protectants because once the fungus is established on the plant, it causes damage and is often difficult to destroy. Eradicants are often used when protectants are not available, are not applied in time, or are too expensive. They are also applied when a disease appears unexpectedly on a plant or in an area. Eradicants are often used on fruits and vegetables when the protectant spray was not applied in time.)

VII. Situation where nonselective herbicide would be used--To kill all the plants in the area (Transparency 2)

Examples: Clearing under guardrails and fences; total control of weeds in industrial areas

VIII. Situation where selective herbicide would be used--To kill some plants with little or no injury to other plants (Transparency 2)

Examples: Broadleaf plants are to be killed in cotton; herbicides used postemergence on crops and weeds

IX. Preplanting, preemergence, postemergence (Transparency 3)

(NOTE: The timing of application is important to protect nontarget plants.)

A. Preplanting treatment is made before the crop is planted

B. Preemergence treatment is made before the crop or weeds appear

C. Postemergence treatment is made after the crop or weeds appear

(NOTE: Postemergence applications must be very selective. They must control the weeds but leave the crop unharmed. Often the chemical will be applied postemergence to the crop but preemergence to the weeds.)

X. Importance of timing of pesticide application--Care must be taken to get the job done effectively without hurting desirable plants and animals, including natural enemies

(NOTE: Directions on the label state when to apply the pesticide for best results.)

XI. Types of chemicals used to alter or change normal crop growth processes (Transparency 4)

A. Growth regulator

B. Defoliant

C. Desiccant

D. Antitranspirant

XII. Climatic factors that affect pesticide application

A. Soil moisture

(NOTE: Pesticides work best with moderate soil moisture. Wetness may keep the pesticide from contacting the soil particles.)

B. Rain

(NOTE: Rain often causes pesticides to leach out of or run off the application site. It also may wash pesticides off foliage. However, preemergence herbicides and protectant or preventive fungicides are sometimes purposely applied just before or soon after rain.)

C. Humidity

(NOTE: Herbicides work best when weeds are growing fast. High humidity and warm temperatures help cause this growth.)

D. Temperature

(NOTE: High temperatures cause some pesticides to evaporate more quickly than is desirable. Low temperatures may slow down or stop the activity of some pesticides.)

E. Light

(NOTE: Light aids in breaking down pesticides.)

XIII. Factors to consider when choosing the appropriate pesticide

A. Has directions on the label for the intended use

B. Is effective against the pest

C. Will not cause injury to the plant or other surface to which it is applied

D. Will cause the least damage to beneficial organisms

E. Will not move off the treated area and into the environment to harm fish and wildlife

F. Works well in the machinery available

G. Is worth the cost

(NOTE: Cost of application should be compared to the price of the area to be treated.)

H. Is safe to use

XIV. Conditions that may make control of a pest unnecessary

A. Damage shows, but the pest which caused it may have left the area or may not be causing any further damage

B. Damage may not be as great as the cost of the pesticide application

XV. Good pest control

A. Use all available methods to keep pest damage below economically harmful levels

B. Damage the environment as little as possible

XVI. Pest control methods (Transparency 5)

(NOTE: Most pest control practices have been used for years.)

A. Resistant variety--Choosing crops, animals, and lumber which resist or are unharmed by pests

B. Biological control--Natural enemies such as parasites, predators, and disease agents are used to control pests, especially insects, mites, and some weeds

(NOTE: The farmer can support the pest's natural enemies by choosing pesticides carefully to avoid injuring the enemies. Releasing more of a pest's natural enemies into the target area can increase this biological control.)

C. Cultural control--Planting, growing, harvesting, and tillage practices may help or harm pests

Example: Cultivation is harmful to weeds but may result in the spread of diseases and nematodes

(NOTE: Other cultural practices are crop rotation, time of planting, and proper fertilizing.)

D. Mechanical-physical control--Traps, barriers, light, sound, heat, cold, radiation, and electrocution are all used to remove or keep the pests from the area where they are not wanted

Examples: Rat trap, screen, light trap, ultra sound, soil steam sterilizer, freezer, nuclear radiation

E. Sanitation--Removing the source of food or nest site will aid in getting rid of pests

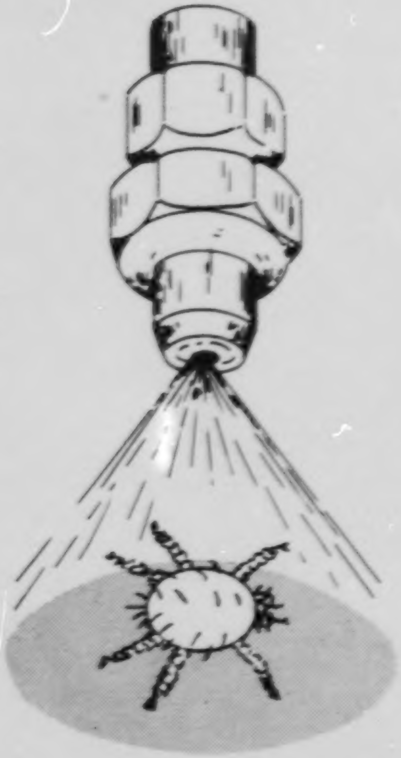
Example: Removing crop residues by plowing

F. Legal control--Includes quarantines, inspections, embargoes, and compulsory crop or product destruction

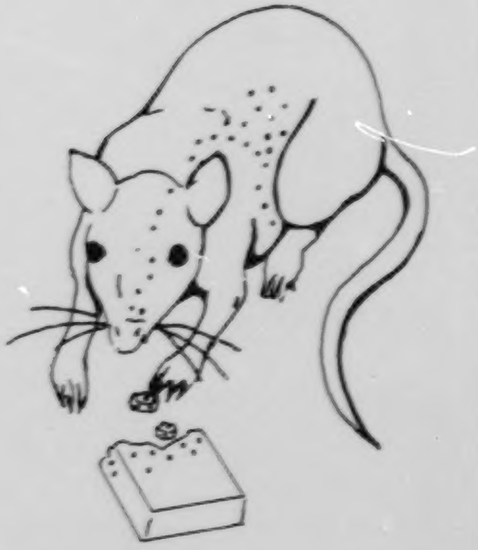
G. Pesticide--Used where other control methods would not provide the needed control

XVII. Integrated control--Putting all pest control methods together into a planned program to achieve pest control and protect people and the environment (Transparency 6)

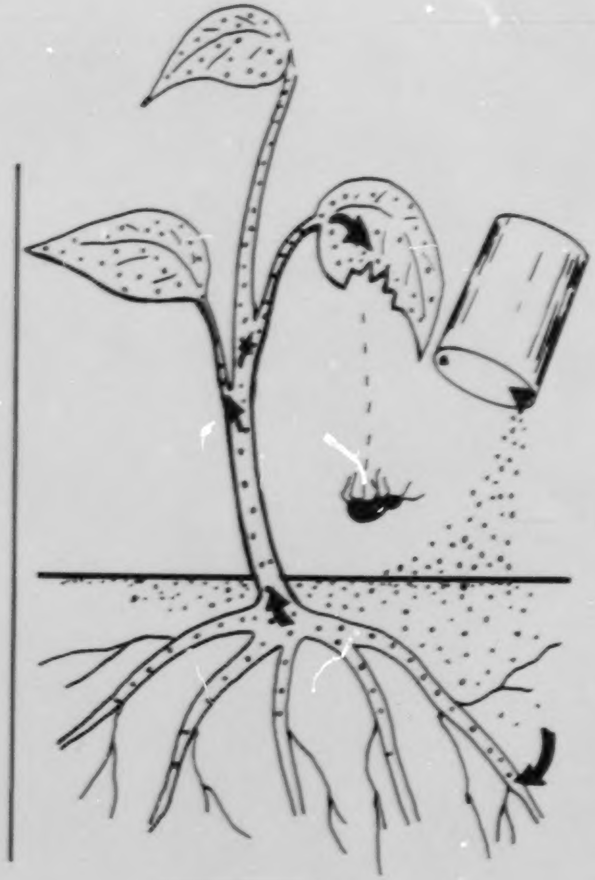
# Ways Pesticides Attack Pests



Contact Poison



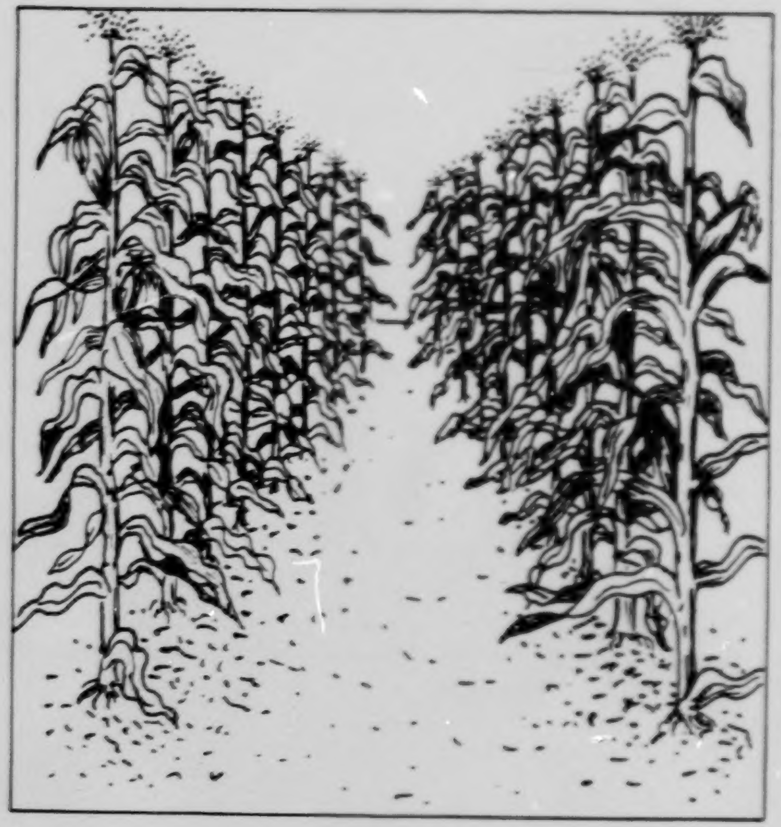
Stomach Poison



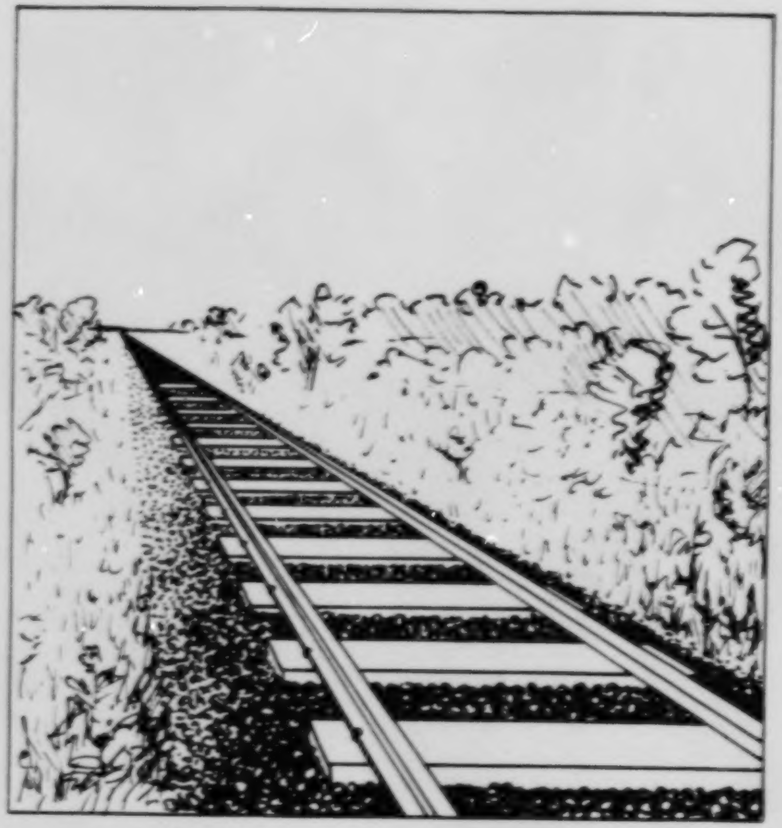
Systemic Poison

TM 1

# Selective vs Nonselective Herbicide



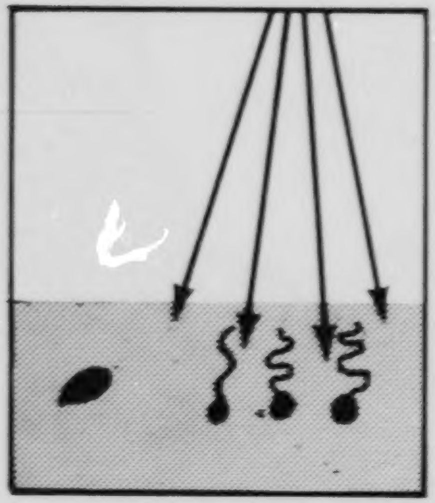
Selective



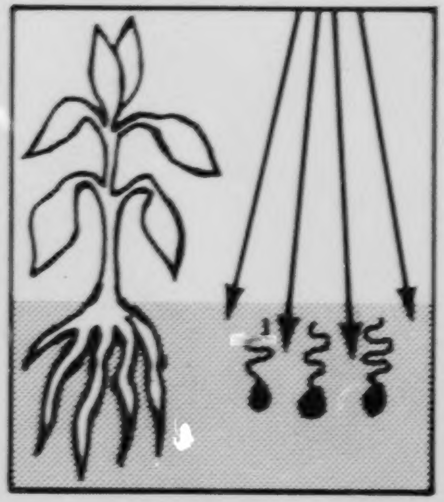
Nonselective

TM 2

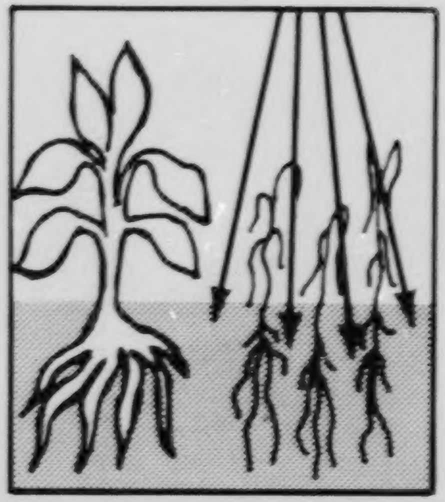
# Preemergence and Postemergence



Preemergence to the Crop and Weeds

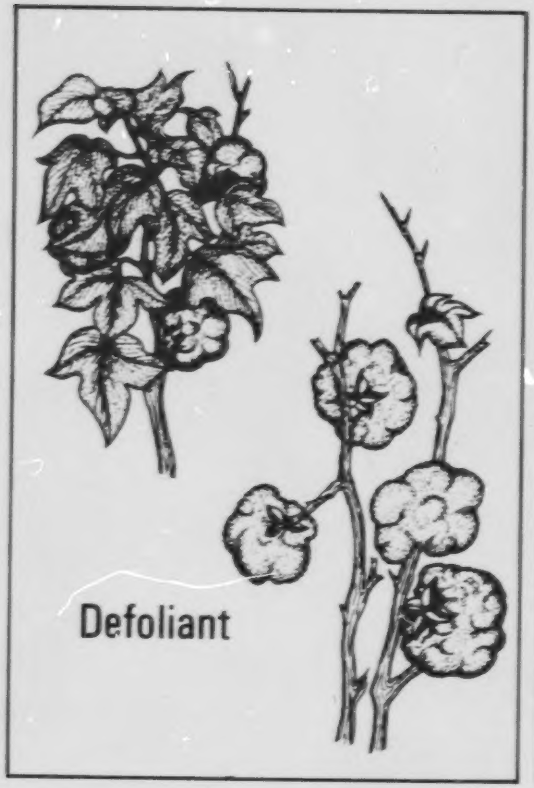


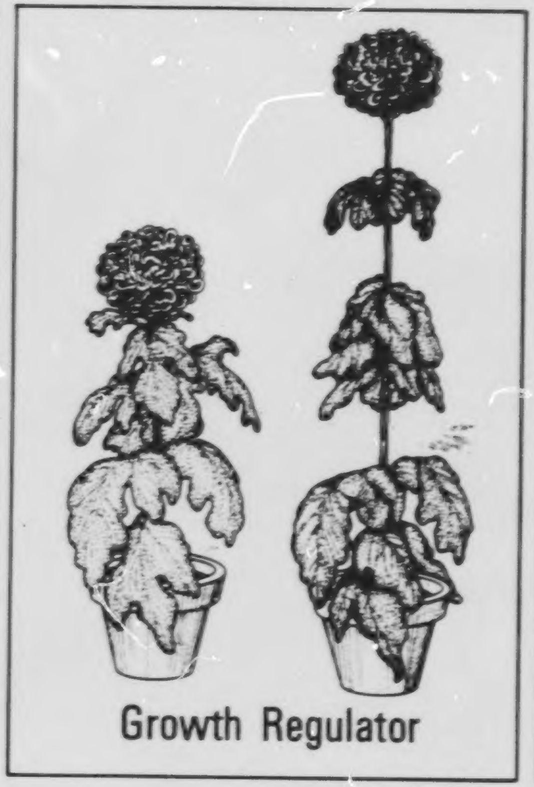
Postemerged Crop Preemerged Weeds

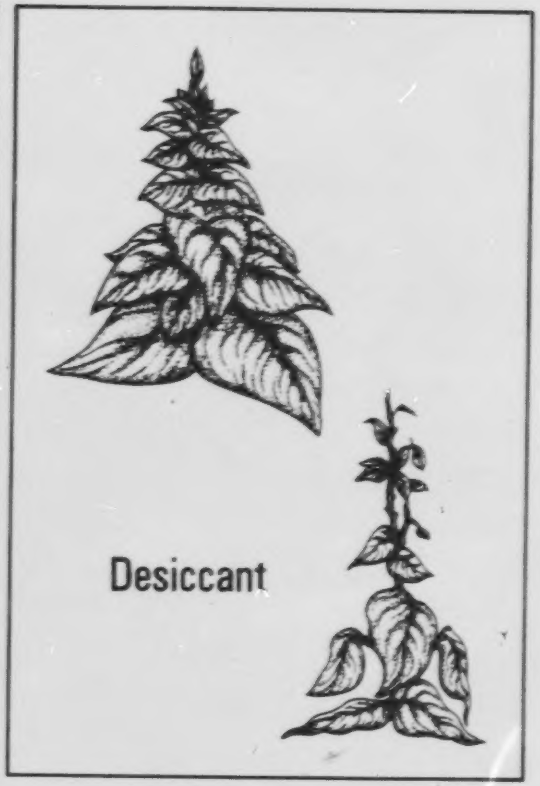


Postemergence to the Crop and Weeds

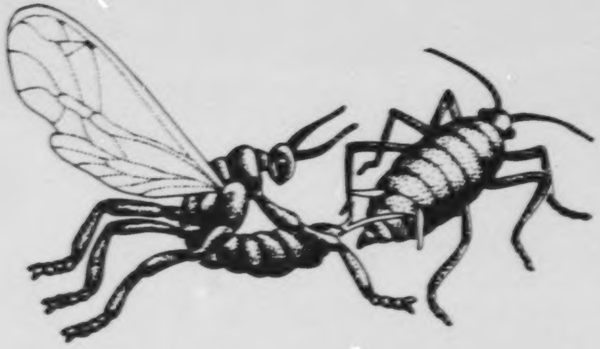
# Chemicals Which Alter or Change Normal Plant Growth


Defoliant

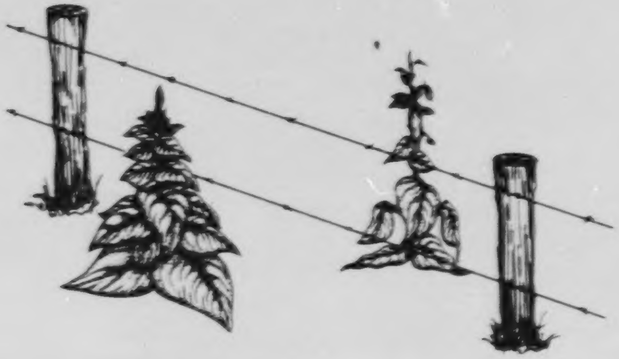

Growth Regulator


Desiccant

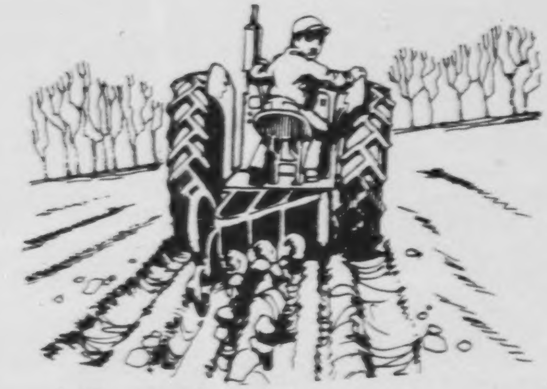
# Alternate Control Methods



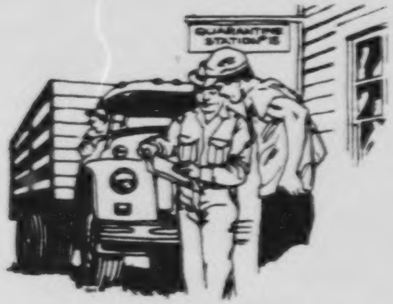
Biological Control



Resistant Varieties



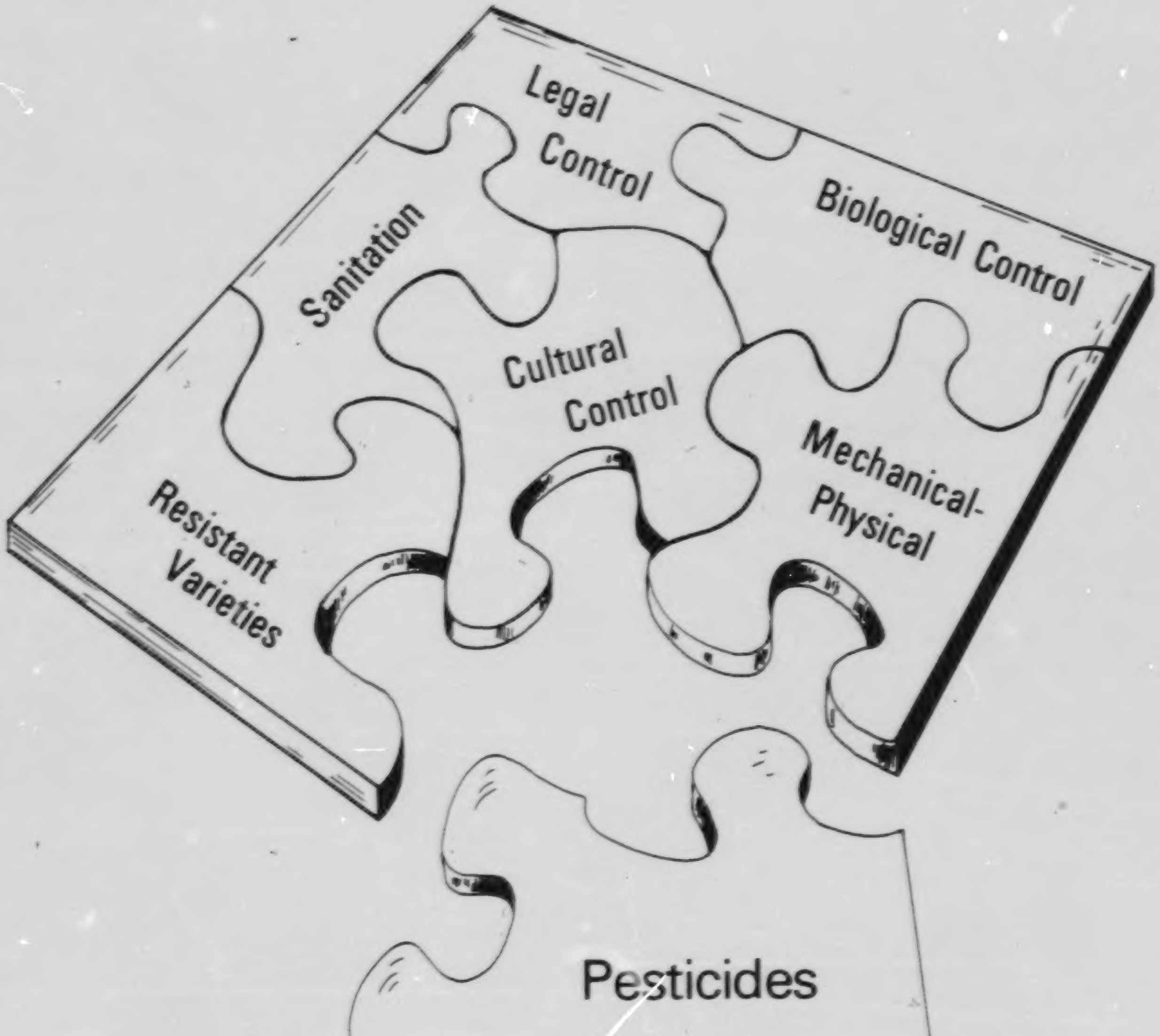
Cultural Control


QUARANTINE STATION

Legal Control

TM 5

# Integrated Control


Legal Control
Biological Control
Sanitation
Cultural Control
Mechanical-Physical
Resistant Varieties
Pesticides

## PESTICIDES
## UNIT IV

## ASSIGNMENT SHEET #1--INTERPRET PESTICIDE LABELS

Read the labels provided on the following pages and answer the questions below.

1. Using the De Metho label, answer the following questions.

   a. What type of pesticide is this?

   b. Is this a short-term (nonpersistent) or residual (persistent) pesticide? Why?

   c. Would this broad spectrum pesticide cause a potential problem if numerous biological controls such as parasites and predators were in the area? Why?

   d. Would it be a good choice if several different kinds of insects were a problem?

2. Using the No-Disease label, answer the following questions.

   a. What type of pesticide is this?

   b. When used as a foliar spray, is it a protectant or preventive spray or an eradicant spray?

3. Using the Anti-Weed label, answer the following questions.

   a. What type of pesticide is this?

   b. Is this selective or nonselective when used on corn?

   c. Is this used as preplant, preemergence, or postemergence?

### PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

(DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing. Wear tightly-woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance, call 000-000-0000.

TO PHYSICIAN: De Metho is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eyes, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable: Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within
24 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposed in approved landfill or buried in a safe place.

Contact Federal, State or local Disposal authorities for approved alternate procedures.

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

SPECIMEN

# DE METHO

INSECTICIDE

Emulsifiable Concentrate

| | | |
|---|---|---|
| ACTIVE INGREDIENT: | METHOMYL — | 24% |
| INERT INGREDIENTS: | | 76% |
| TOTAL: | | 100% |

Net Content: 50 gallons

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician im

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minut physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and im wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

ESTABLISHMENT NO. 1357-VT-1
EPA REGISTRATION NO. 1357-43

### DIRECTIONS FOR USE CONTINUED

### SPRAY PREPARATION

Fill spray tank ½ to ¾ full of water. Add De Metho directly to spray tank and mix thoroughly, using mechanical or hydraulic means. Do not use air agitation.

### APPLICATION

Apply at the recommended rates when insects first appear. Unless otherwise noted, continue applications at 5- to 7-day intervals or as needed. Use sufficient water (5-10 gals per acre by air) to obtain thorough, uniform coverage. Apply the low rates on small plants, small worms and light infestations of insects. Use intermediate rates on larger worms and heavier infestations of insects. Use 1 to 3 applications of the highest recommended rate for controlling severe infestations; thereafter, use the lowest rate possible to maintain control.

### NOTICE TO BUYER

Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller. Buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

### CROP USAGE

| CROPS Method of application [illegible] | | INSECTS | RATE PER ACRE | LAST APPLICATION DAYS | |
|---|---|---|---|---|---|
| | | | | TO HARVEST | TO LIVESTOCK GRAZING/FEEDING |
| [illegible] | A G | [illegible] | 2-4 | | 7 |
| [illegible] | G | [illegible] | 1-2 | | 3 [illegible] |
| | | [illegible] | 2 | 2 | 7 [illegible] |
| [illegible] | | [illegible] | 1-2 | 7 | |
| [illegible] | A G | [illegible] | 2-4 | 14 | |
| [illegible] | A G | [illegible] | 2-4 | 14 | |
| [illegible] | A G | [illegible] | 1-4 | 2 | |
| [illegible] | A G | [illegible] | 4 | 14 | |
| [illegible] | | [illegible] | 1 1/2-2 | 2 | |
| | | [illegible] | 1-2 | | |
| | A G | [illegible] | 2 | [illegible] | 3 [illegible] |
| [illegible] | G | [illegible] | 2-4 | 3 | |
| [illegible] | | [illegible] | 1-2 | 3 | |
| | A G | [illegible] | 2-4 | 10 | |
| [illegible] | G | [illegible] | 2-4 | 7 | |
| [illegible] | G | [illegible] | 1-4 | 21 | [illegible] |
| [illegible] | A G | [illegible] | 2 | 10 | |
| [illegible] | | [illegible] | 2 | | |
| | | [illegible] | 2-4 | | |
| | A G | [illegible] | 2 | 10 | |
| [illegible] | G | [illegible] | 2-4 | 3 | |
| [illegible] | | [illegible] | 2 | 3 | |
| | A G | [illegible] | [illegible] 2-4 | 3 | |
| [illegible] | | [illegible] | 1-2 | 7 [illegible] | |
| | A G | [illegible] | 2 | [illegible] | |
| [illegible] | G | [illegible] | [illegible] | | |

[illegible]

ASSIGNMENT SHEET #1

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with.

**ALMONDS:** **Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half to full bloom.

**APPLES, PEARS:** Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP):** **White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 20% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH:** **Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII):** **Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES:** **Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS:** **Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 35 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL

# NO-DISEASE

## BENOMYL FUNGICIDE

**Wettable Powder**

| | |
|---|---|
| **ACTIVE INGREDIENT** | |
| Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate] | 50% |
| **INERT INGREDIENTS** | 50% |

[illegible]  EPA Est. 1352-WV-1  EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.
Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing. Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

## NET 50 LBS.

B-21150 B-734  Made in U.S.A.  Printed in U.S.A.

## KILL-DEAD CHEMICALS

Chemical City, West Virginia

**PECANS:** **Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may be added to the spray to improve wetting of foliage. Apply at prepollination when young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE:** **Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. per 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thorough wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom; apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall. **Powdery Mildew**—shuck fall and first cover. **Cherry Leaf Spot**—2 to 3 weeks after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by **Rhizopus** spp. and **Alternaria** spp.

**STRAWBERRIES:** **Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Leaf Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue at 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acre when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals as needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII):** **Pineapple Disease (Ceratocystis paradoxa)**—Apply to cut seedpieces either as a cold dip or hot dip.

Cold Dip—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to give thorough wetting; remove and allow to drain.

Hot Dip—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of the dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES (Powdery Mildew, Black Spot); FLOWERS, ORNAMENTALS (Powdery Mildew, Botrytis Gray Mold):** Field and Greenhouse—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, use 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-day intervals throughout the growing season; shorten interval during humid, rainy weather. Addition of a surfactant to the spray mixture enhances curative action of the fungicide, and improves distribution of the spray on hard-to-wet plants such as roses.

**BULBS (Easter Lily, Tulip, Gladiolus, Daffodil, Iris): Fusarium and Penicillium Rots**—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak cleaned bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hours after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bulbs have been heat-cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

ASSIGNMENT SHEET #1

# Anti-Weed

## 20G

SAMPLE LABEL

## Herbicide

FOR WEED CONTROL IN CORN

| Active Ingredients: | |
|---|---|
| Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . | 20.0% |
| Inert Ingredients: | 80.0% |
| Total: | 100.0% |

Anti-Weed 20G is a granular herbicide

## Warning:

Keep out of reach of children. See additional warning statements on back of bag.

**50**
**Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

# KILL-DEAD

Chemical Company
Chemical City, West Virginia

# ASSIGNMENT SHEET #1

**DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY**

**IMPORTANT**: Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

## Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of **Kill-Dead** or the Seller. All such risks shall be assumed by the Buyer.

**Kill-Dead** warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks referred to above. **Kill-Dead makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty**. In no case shall **Kill-Dead** or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. **Kill-Dead** and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of **Kill-Dead Chemical Company**.

## General Information

**Anti-Weed** will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since **Anti-Weed** acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

**Anti-Weed** is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using **Anti-Weed** where adjacent desirable trees, shrubs or plants might be injured.

Store **Anti-Weed** in a dry place.

**Application Instructions**
Broadcast or Overall Treatment
Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment
Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \text{Recommended Broadcast Rate} = \text{lbs./Acre Anti-Weed for Band Treatment}$$

Range of Rates: In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

## Directions for Use

**Anti-Weed** controls most annual broadleaf and grass weeds such as:

Giant Foxtail
Green Foxtail
Yellow Foxtail
Barnyardgrass
  (Watergrass)
Crabgrass

Fall Panicum
Annual Morningglory
Cocklebur
Sandbur
Jimsonweed
Lambsquarters

Mustard
Pigweed
Ragweed
Smartweed
Sunflower
Velvetleaf

**Anti-Weed** will not control perennial weeds such as:

Johnsongrass  Field Bindweed  Canada Thistle  Bull Nettle

Apply **Anti-Weed** at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| **Soil** | **Rate per acre of** Anti-Weed **Broadcast*** |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–<br>30 lbs |

*For calculation of band treatment rate, see Application Instructions Section.

** **Anti-Weed** should not be used on high organic soils such as peat and muck.

**Suggestions for Crop Rotations**
1) Corn may be replanted at any time following application of **Anti-Weed**. 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions**: 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following **Anti-Weed** application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

## Warning

Keep out of reach of children.

**Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.**

**This product is toxic to fish. Keep out of lakes, ponds and streams.**

---

**Do not reuse container. Destroy when empty.**

## ANSWERS TO ASSIGNMENT SHEET

1. a. Insecticide

   b. Relatively short term; because it can be applied fairly close to harvest date and contains no other precautions on persistence

   c. Yes. It might harm all the beneficial insects also

   d. Yes

2. a. Fungicide

   b. Both

3. a. Herbicide

   b. Selective; kills some weeds but does not harm corn

   c. Preemergence and at planting

## PESTICIDES
## UNIT IV

## TEST

1. Match the terms on the right to the correct definitions. (Answers for "a" through "l" are on this page.)

______a. Chemical or other substance that will destroy or control a pest or protect something from a pest

______b. Pesticide which kills when swallowed

______c. Pesticide that is taken up by one part of a plant or animal and moved to another section where it acts against a pest

______d. Pesticide that breaks down almost immediately into nontoxic by-products

______e. Pesticide which enters the pest in the form of a gas and kills it

______f. Pesticide that remains in the environment for a fairly long time

______g. Pesticide spray which is evenly applied to the outside of the object to be protected

______h. Pesticide which kills when it touches or is touched by the pest

______i. Pesticide applied before pests are actually found but where they are expected

______j. Pesticide which kills the pest after it appears

______k. Pesticide used before the crop is planted

______l. Pesticide used before crop or weeds appear; may also refer to use after crop emerges or is established but before weeds emerge

1. Short-term (nonpersistent)
2. Stomach poison
3. Pesticide
4. Eradicant
5. Preplant
6. Residual (persistent)
7. Systemic
8. Surface spray
9. Contact poison
10. Protectant (preventive)
11. Preemergence
12. Fumigant poison

(Answers for "m" through "z" are on this page.)

______m. Pesticide used after crop or weeds have appeared

______n. Pesticide which draws moisture from or dries up a plant, plant part, or insect causing it to die

______o. Pesticide which causes the leaves of a plant to drop off

______p. Pesticide used to control insects

______q. Chemical which coats the leaves of plants to reduce water loss

______r. Pesticide which increases, decreases, or changes the normal growth of a plant

______s. Pesticide used to control unwanted plants

______t. Pesticide used to control fungi which cause molds, rots, and other plant diseases

______u. Pesticide used to control rodents such as rats and mice

______v. Pesticide used to control nematodes

______w. Pesticide used to control mites

______x. Pesticide which is toxic to a wide range of pests; used when several different pests are a problem

______y. Pesticide which is toxic to all or most plants or animals of a type; usually used to describe a particular type of pesticide

______z. Pesticide which is more toxic to some types of plants or animals than to others; usually used to describe a particular type of pesticide

13. Postemergence
14. Fungicide
15. Herbicide
16. Desiccant
17. Defoliant
18. Rodenticide
19. Insecticide
20. Antitranspirant
21. Nematicide
22. Growth regulator
23. Miticide
24. Nonselective
25. Selective
26. Broad spectrum (nonselective)

2. Match the ways a pesticide attacks a pest on the right to the correct method of application.

_____a. Used as a bait, surface spray, or dust; must be eaten by the pest

_____b. Used as a surface spray, dust, or in soil incorporation; must touch or be touched by the pest

_____c. Used as a surface or foliar spray, pour-on, injection, or granule

_____d. Applied as a gas or as a liquid which then vaporizes

1. Fumigant poison
2. Contact poison
3. Systemic poison
4. Stomach poison

3. Describe a situation where short-term (nonpersistent) insecticides are often used.

4. Describe a situation where residual (persistent) insecticides are often used.

5. Describe a situation where broad spectrum (nonselective) insecticides are often used.

6. Distinguish between protectant pesticides (P) and eradicant pesticides (E) by putting a "P" or "E" in the space provided.

_____a. Fungicide designed to prevent the plant from getting the disease

_____b. Fungicide which kills the disease after it appears in or on the plant

7. Describe a situation where a nonselective herbicide would be used.

8. Describe a situation where a selective herbicide would be used.

9. State the differences between preplanting, preemergence, and postemergence.

10. Explain why timing of a pesticide application is important.

11. List two types of chemicals used to alter or change normal crop growth processes.

a.

b.

12. List two climatic factors affecting pesticide application.

a.

b.

13. List two factors an applicator must consider when choosing the appropriate pesticide.

a.

b.

14. Name two conditions that may make control of a pest unnecessary.

a.

b.

15. Name two factors to consider in good pest control.

a.

b.

16. Match the pest control methods on the right to the correct descriptions.

______a. Used where other control methods would not provide the needed control

______b. Includes quarantines, inspections, embargoes, and compulsory crop or product destruction

______c. Removing the source of food or nest site will aid in getting rid of pests

______d. Traps, barriers, light, sound, heat, cold, radiation, and electrocution are all used to remove or keep the pests from the area where they are not wanted

______e. Planting, growing, harvesting, and tillage practices may help or harm pests

______f. Natural enemies such as parasites, predators, and disease agents are used to control pests, especially insects, mites, and some weeds

______g. Choosing crops, animals, and lumber which resist or are unharmed by pests

1. Pesticide
2. Biological control
3. Legal control
4. Cultural control
5. Sanitation
6. Mechanical-physical control
7. Resistant variety

17. Define integrated control.

18. Interpret the label on the following page to answer the questions below.

a. What type of pesticide is this?

b. Is this selective or nonselective when used at 25 lb/acre rate?

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (CAUTION)

Harmful if swallowed. Avoid application directly to humans. Care should be taken to avoid inhalation of dust or spray mist, or prolonged contact with skin. In case of contact, immediately flush eyes or skin with large amounts of water. Get medical attention if irritation persists. Wear safety goggles or face shield when handling.

### ENVIRONMENTAL HAZARDS

Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from target area.

## DIRECTIONS FOR USE GENERAL CLASSIFICATION

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be disposed of in an incinerator or landfill approved for pesticide containers, or buried in a safe place. Consult Federal, State, or local disposal authorities for approved alternate procedures such as limited open burning.

# DE WEED

HERBICIDE
WETTABLE POWDER

| | |
|---|---|
| ACTIVE INGREDIENT: weedout · tri-azoic acid | 80.0% |
| INERT INGREDIENTS: | 20.0% |
| TOTAL: | 100.0% |

## KEEP OUT OF REACH OF CHILDREN

## CAUTION

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED Induce vomiting
IF INHALED Remove to fresh air
IF IN EYES Flush eyes with plenty of water
IF ON SKIN Remove clothing and wash with detergent and water

MFG BY A-Z CHEMICALS
Aster, Minnesota

EPA ESTABLISHMENT NO. 1357-MN-1
EPA REGISTRATION NO. 1357-41

## DIRECTIONS FOR USE CONTINUED

Deweed is for weed control in certain crops, ornamental plantings, on industrial sites, and around-the-farm. It should be applied before weeds emerge or following removal of weed growth. It controls a wide variety of annual broadleaf and grass weeds when used at selective rates in agricultural crops and ornamental plantings. When used at higher, non-selective rates in non crop areas, it also controls many perennial broadleaf and grass weeds.

GROUND APPLICATION. Use conventional spray equipment with 80° flat-fan nozzles. Screens in spray system should be no finer than 50 mesh. Use a pump with capacity to maintain 35-40 psi at nozzles. Use hydraulic or mechanical agitation during mixing and application to maintain a uniform suspension. Aerial application: Use only where specified in the use directions.

BLUEBERRIES and CANEBERRIES (blackberries, boysenberries, loganberries, raspberries)—Quackgrass. Apply 5 lbs per acre in the fall or split the application applying 2½ lbs per acre in the fall plus 2½ lbs per acre in the spring, when quackgrass is growing. Do not apply when fruit is present.

ALFALFA—Pure alfalfa less than one year old (Northeastern U.S. only)—Henbit, wild mustard, chickweed, alyssum, downy brome, wild oats, and pigweed. Pure alfalfa which has been seeded in the spring (before June 1) may be treated in the fall after the last cutting but before frozen ground conditions. Apply 1 lb. of De Weed per acre. For ground application apply in a minimum of 2½ gals. of water per acre.

GRASSES GROWN FOR SEED (Pacific Northwest only). Perennial ryegrass, tall fescue and fine fescues, such as Pennlawn, Chewings, Rainier, and related species. Control of broadleaf weeds and annual grasses including annual ryegrass, rattail fescue, silver hairgrass and downy brome. Apply 2½ lbs of De Weed in a minimum of 15 gals of water per acre as soon as fall rains start. Apply only to grasses from which at least one seed crop has been cut.

WEED CONTROL on industrial sites, highway medians, and shoulders, railroad rights-of-way, lumber yards, and in non-crop areas on farms such as around buildings, fuel storage areas, along fences, roadsides, and lanes. Aerial application may be made where it is feasible. Use at least 1 gal of water for each 1 lb. of De Weed; use more water if practical for both ground and aerial application. To control annual broadleaf and grass weeds, (including barnyard grass, cheat, crabgrass, lambsquarters, foxtail, ragweed, puncturevine and mullein), apply 6-12½ lbs. per acre. To control most annual and many perennial broadleaf and grass weeds (including quackgrass, bluegrass, redtop, burdock, Canada thistle, orchardgrass, dogfennel, and plantain), apply 12½-25 lbs. per acre. To control hard-to-kill perennial weeds (including bull thistle and sow thistle), apply 25-50 lbs. per acre.

NET WEIGHT FIVE POUNDS

# PESTICIDES
# UNIT IV

## ANSWERS TO TEST

1.
   - a. 3
   - b. 2
   - c. 7
   - d. 1
   - e. 12
   - f. 6
   - g. 8
   - h. 9
   - i. 10
   - j. 4
   - k. 5
   - l. 11
   - m. 13
   - n. 16
   - o. 17
   - p. 19
   - q. 20
   - r. 22
   - s. 15
   - t. 14
   - u. 18
   - v. 21
   - w. 23
   - x. 26 or 24
   - y. 24 or 26
   - z. 25

2.
   - a. 4
   - b. 2
   - c. 3
   - d. 1

3. Description should include any one of the following:
   - a. Insects do not return
   - b. Long-term exposure could injure nontarget plants or animals
   - c. Short time until harvest of food crop
   - d. Short time until slaughter of livestock or poultry
   - e. In homes and dwellings where people and domestic animals might be exposed

4. Description should include any one of the following:
   - a. Insects are constant control problem and there will be no environmental hazard
   - b. Fly control in livestock buildings
   - c. Soil pesticides

5. Description should include any one of the following:

   a. General purpose or wide range killing

   b. Presence of several different kinds of insects

6. a. P

   b. E

7. To kill all the plants in the area

8. To kill some plants with little or no injury to other plants

9. a. Preplanting treatment is made before the crop is planted

   b. Preemergence treatment is made before the crop or weeds appear

   c. Postemergence treatment is made after the crop or weeds appear

10. Care must be taken to get the job done effectively without hurting desirable plants and animals, including natural enemies

11. Any two of the following:

    a. Growth regulator

    b. Defoliant

    c. Desiccant

    d. Antitranspirant

12. Any two of the following:

    a. Soil moisture

    b. Rain

    c. Humidity

    d. Temperature

    e. Light

13. Any two of the following:

    a. Has directions on the label for the intended use

    b. Is effective against the pest

    c. Will not cause injury to the plant or other surface to which it is applied

d. Will cause the least damage to beneficial organisms

e. Will not move off the treated area and into the environment to harm fish and wildlife

f. Works well in the machinery available

g. Is worth the cost

h. Is safe to use

14. a. Damage shows, but the pest which caused it may have left the area or may not be causing any further damage

b. Damage may not be as great as the cost of the pesticide application

15. a. Use all available methods to keep pest damage below economically harmful levels

b. Damage the environment as little as possible

16. a. 1

b. 3

c. 5

d. 6

e. 4

f. 2

g. 7

17. Putting all pest control methods together into a planned program to achieve pest control and protect people and the environment

18. a. Herbicide

b. Nonselective

# LABELS AND LABELING
## UNIT V

### TERMINAL OBJECTIVE

After completion of this unit, the student should be able to match the terms *common name, chemical name,* and *brand name* to the correct definitions and be able to distinguish between general use and restricted use pesticides. The student should be able to discuss days to harvest and days to slaughter and discuss reentry regulations. The student should be able to identify facts contained on pesticide labels and to interpret label information. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

### SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with labels and labeling to the correct definitions.
2. Select from a list statements indicating when to read a label.
3. Match the users of labels to ways the labels are used.
4. Select from a list the agency in the federal government responsible for regulating sale and use of pesticides and registering labels.
5. Identify facts contained on a pesticide label.
6. Match the terms *common name, chemical name* and *brand name* to the correct definitions.
7. Match the signal words found on labels to their toxicity categories.
8. Discuss in a short paragraph days to harvest and days to slaughter in the application of pesticides.
9. Discuss reentry regulations following application of pesticides.
10. Name the factors that form the basis for pesticide classification.
11. Distinguish between general use and restricted use pesticides.
12. Interpret labels correctly by answering questions pertaining to labels.

# LABELS AND LABELING
## UNIT V

## SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide student with objective sheet.

  B. Provide student with information and assignment sheets.

  C. Make transparencies.

  D. Discuss terminal and specific objectives.

  E. Discuss information and assignment sheets.

  F. Secure pesticide labels and make available to students.

  G. Ask students to reorganize a sample label into the format of the future pesticide label. Tell them to add any information which is missing.

  H. Ask students to design a pesticide label and discuss with them what was left off.

  I. Give test.

II. Student:

  A. Read objective sheet.

  B. Study information sheet.

  C. Complete assignment sheets.

  D. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

  A. TM 1--Future Pesticide Label

  B. TM 2--Existing Pesticide Label

C. TM 3--Signal Words

D. TM 4--Days to Harvest

E. TM 5--Days to Slaughter

F. TM 6--Reentry Sign

G. TM 7--Future General Use Pesticide Label

H. TM 8--Future Restricted Use Pesticide Label

IV. Assignment sheets

A. Assignment Sheet #1--Interpret De Metho Label

B. Assignment Sheet #2--Interpret De Metho Label

C. Assignment Sheet #3--Interpret Anti-Weed Label

D. Assignment Sheet #4--Interpret No-Disease Label

V. Answers to assignment sheets

VI. Test

VII. Answers to test

# LABELS AND LABELING
## UNIT V

## INFORMATION SHEET

I. Terms and definitions

   A. Active ingredient--That part of a pesticide product which will kill or control pests or prevent damage by them

      (NOTE: This is the actual poison in a product.)

   B. Label--Written material attached to or printed on a pesticide container or wrapper

   C. Labeling--Technical information including the label and any other printed material provided by the manufacturer or its agent to accompany a pesticide product

   D. Pesticide--Chemical or other substance that will prevent, repel, destroy, or control a pest or protect something from a pest

   E. Pest--Unwanted organism

      (NOTE: An organism may be plant or animal, including bacteria and fungi.)

   F. Poison--Chemical or other substance that can cause injury or death when eaten, absorbed, or inhaled by plants or animals, including man

   G. Signal words--Words which must appear on pesticide labels to show toxicity of pesticide

   H. Toxic--Poisonous; ability to cause injury to plants and animals, including humans

   I. Reentry--Period of time between a pesticide application and when workers may go back into an area without wearing protective clothing or equipment

II. When to read the label

   A. Before use or purchase

   B. Before mixing

   C. Before applying

   D. Before transporting, storing, and disposing

# INFORMATION SHEET

III. Users of labels and ways labels are used

   A. Federal and state governments--Use labels to control sale, use, safety, storage, and disposal of pesticides

   B. Manufacturers of pesticides--Use labels as the license to sell a pesticide

   (NOTE: Until the label is registered the pesticide may not be sold or used.)

   C. Dealers and pest control experts--Use labels to aid in making recommendations to buyers and users

   D. Buyers and users

      1. Use labels as a way of deciding which pesticide will be effective against the pest and be the safest to use

      2. Use labels to decide what safety precautions to take and how much pesticide to use

      (NOTE: Some labels are easy to understand. Others are complicated. However, all labels tell you how to use the product correctly.)

   E. Physicians--Use labels to determine the antidote to use in the proper treatment of poisoning cases

IV. Agency in the federal government responsible for regulating sale and use of pesticides and registering labels--Environmental Protection Agency (EPA)

   (NOTE: Most states also register pesticides.)

V. Facts contained on pesticide label (Transparency 1)

   A. Name and address of chemical company

   B. Brand (trade) name

   C. Name and amounts of all active ingredients

   (NOTE: The label will also list the amounts of inert ingredients.)

   D. Type of pesticide

   E. Kind of formulation

   F. EPA registration and establishment numbers

   G. Storage and disposal precautions

H. Hazard statement

(NOTE: This statement describes environmental hazards, human hazards, animal and plant hazards, and physical and chemical hazards.)

I. Directions for use

J. Net content

K. Words: *Keep Out Of Reach Of Children*

L. Signal word

M. Days to harvest or slaughter

N. Reentry interval, if applicable

O. General use or restricted use classification statement

VI. Names found on labels (Transparency 2)

A. Brand name--Name used by a manufacturer to identify a pesticide as their product

(NOTE: The brand name may not be used in the ingredient statement but usually appears in large, bold-faced letters on the packaging. One brand name, such as Ortho, may appear on the label of several different kinds of pesticide chemicals.)

B. Common name--Well-known, made-up name accepted by the Environmental Protection Agency to identify the active ingredients in a pesticide

(NOTE: The common name must be used in the active ingredients section on the label and is usually not capitalized.)

C. Chemical name--Scientific "often complicated" name which tells what the active ingredients are

(NOTE: When an accepted common name is not available, the chemical name must be used to name the active ingredients in the ingredient section of the label. Often both the chemical name and the common name appear.)

VII. Signal words found on labels (Transparency 3)

A. Danger--Highly toxic pesticides; the word *poison* printed in red and the skull and crossbones symbol are also required on labels of highly toxic pesticides

B. Warning--Moderately toxic pesticides

C. Caution--Slightly toxic to relatively nontoxic pesticides

VIII. Days to harvest and days to slaughter in the application of pesticides (Transparencies 4 and 5)

  A. Residue amounts are determined and safe tolerances are set

  B. Least number of days between last pesticide application and harvest or slaughter are determined to remain under tolerance

  C. Days to harvest or slaughter are listed on the label

  D. Harvest or slaughter should not be attempted before time period is over

  (NOTE: It is up to you, the applicator, to help make sure that no illegal residue remains on food crops. Follow label directions carefully. Don't be responsible for seizure of your crops or those of your neighbor.)

IX. Reentry regulations (Transparency 6)

  A. Wait at least until the deposit has dried or the dust has settled before reentering the field, even with the least hazardous pesticides

  B. Follow reentry times on label

  C. Do not allow workers, children, or other persons to reenter the sprayed area until this time has passed

  D. Wear protective clothing and equipment if reentry must be made before time elapses

  E. Federal standards require that at least a hat, shoes and socks, and closely woven fabric coveralls with long sleeves and trouser legs (or long sleeved shirt and long legged trousers) be worn if early reentry must be made

  (CAUTION: Use common sense! Use more protective clothing and equipment if you think they may be needed for safe reentry.)

X. Basis for pesticide classification into general use or restricted use pesticides

  A. Hazard of poisoning

  B. Way pesticide is used

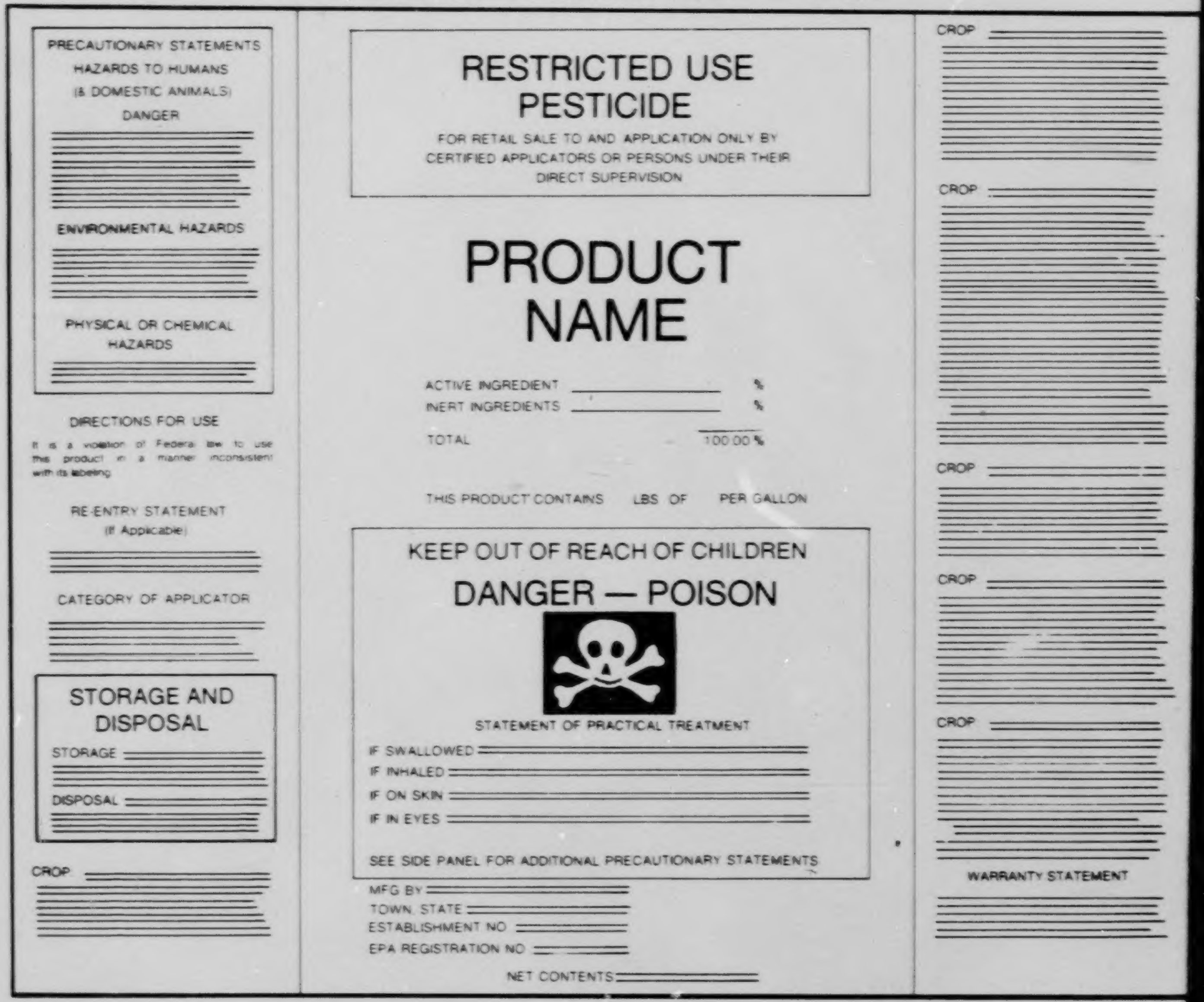
  C. Effects on the environment

XI. General use versus restricted use pesticides (Transparencies 7 and 8)

  A. General use--Pesticide use that will not cause excessive damage in the environment or endanger the applicator or other persons when applied according to label directions

  B. Restricted use--Pesticide use that may cause damage in the environment or endanger the applicator or other persons even when label directions are followed

# Future Pesticide Label



PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS
(& DOMESTIC ANIMALS)
DANGER

ENVIRONMENTAL HAZARDS

PHYSICAL OR CHEMICAL HAZARDS

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

RE-ENTRY STATEMENT
(If Applicable)

CATEGORY OF APPLICATOR

STORAGE AND DISPOSAL

STORAGE

DISPOSAL

CROP

RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

PRODUCT NAME

ACTIVE INGREDIENT ______ %
INERT INGREDIENTS ______ %
TOTAL 100.00 %

THIS PRODUCT CONTAINS LBS OF PER GALLON

KEEP OUT OF REACH OF CHILDREN

DANGER — POISON

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED
IF INHALED
IF ON SKIN
IF IN EYES

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY
TOWN, STATE
ESTABLISHMENT NO
EPA REGISTRATION NO

NET CONTENTS

CROP

CROP

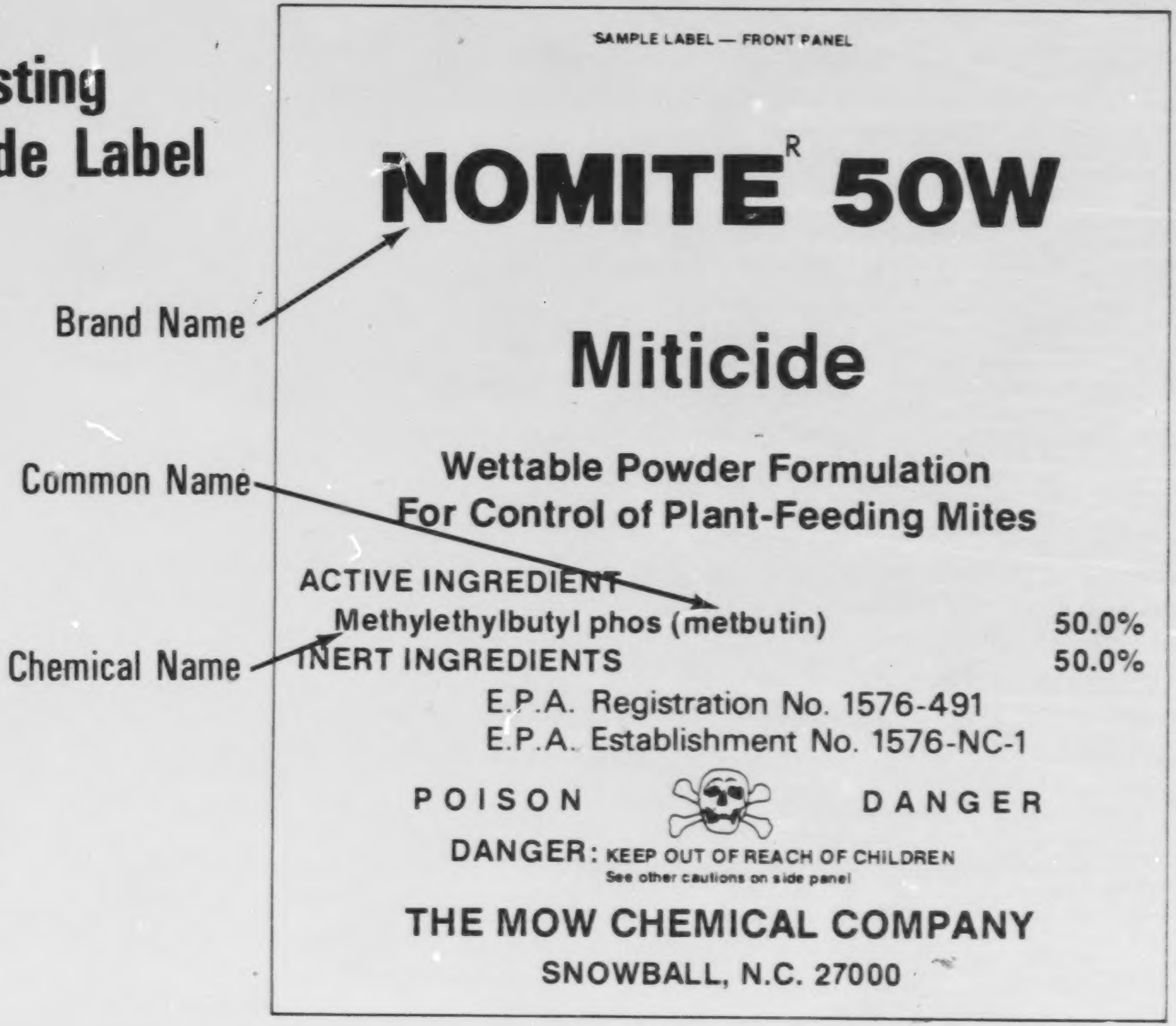
CROP

CROP

CROP

WARRANTY STATEMENT

# Existing Pesticide Label



Brand Name

Common Name

Chemical Name

SAMPLE LABEL — FRONT PANEL

**NOMITE® 50W**

**Miticide**

**Wettable Powder Formulation**
**For Control of Plant-Feeding Mites**

| | |
|---|---|
| ACTIVE INGREDIENT | |
| Methylethylbutyl phos (metbutin) | 50.0% |
| INERT INGREDIENTS | 50.0% |

E.P.A. Registration No. 1576-491
E.P.A. Establishment No. 1576-NC-1

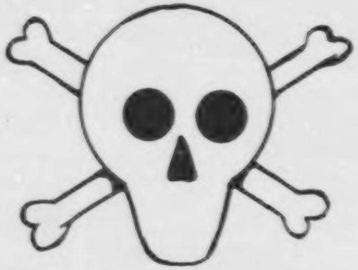
POISON DANGER

DANGER: KEEP OUT OF REACH OF CHILDREN
See other cautions on side panel

THE MOW CHEMICAL COMPANY
SNOWBALL, N.C. 27000

# Signal Words

**DANGER**



**POISON**

Highly Toxic

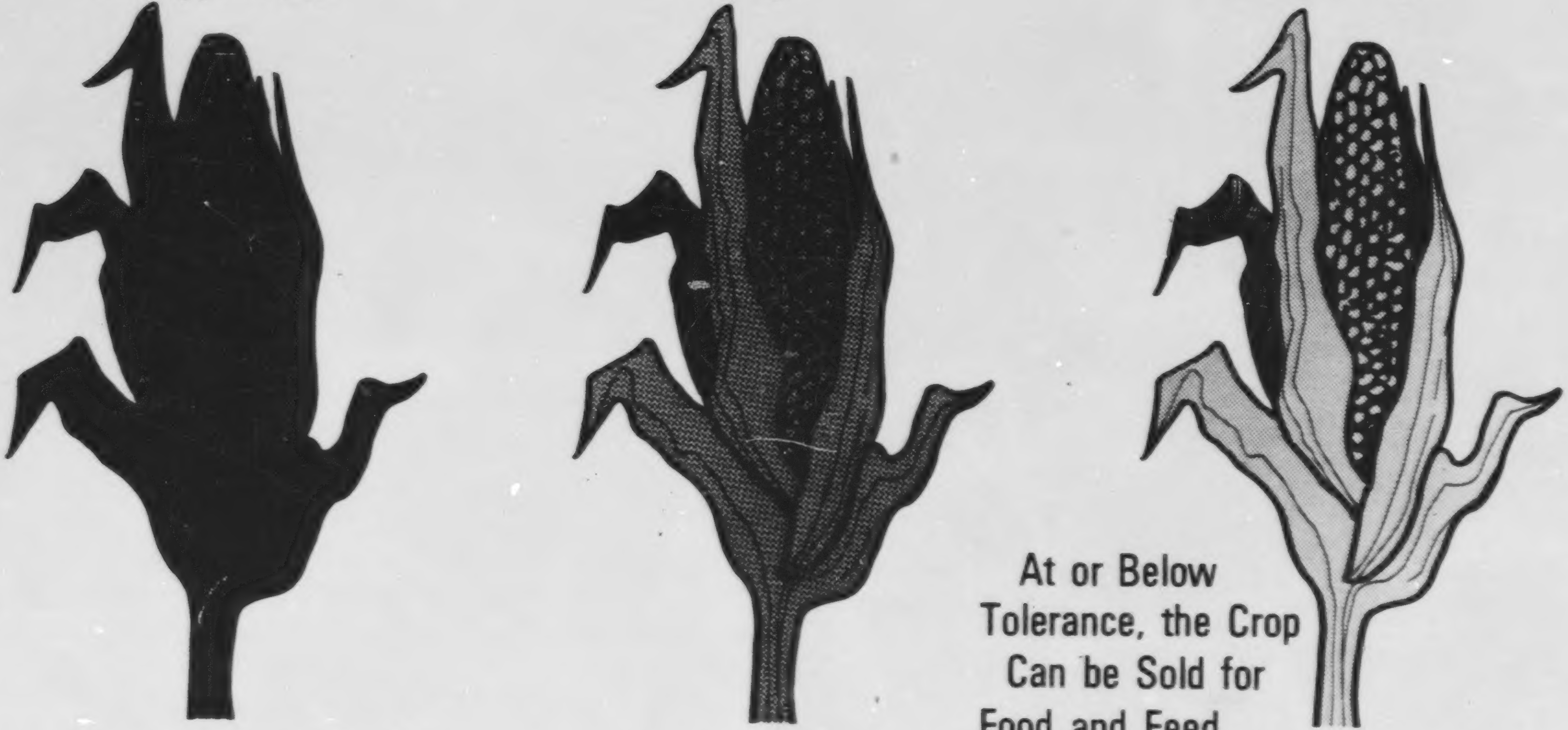
**WARNING**

Moderately Toxic

**CAUTION**

Slightly Toxic to
Relatively Nontoxic

# Days to Harvest



10 PPM
At Application

6 PPM
4 Days

2 PPM
Harvest Day

At or Below
Tolerance, the Crop
Can be Sold for
Food and Feed

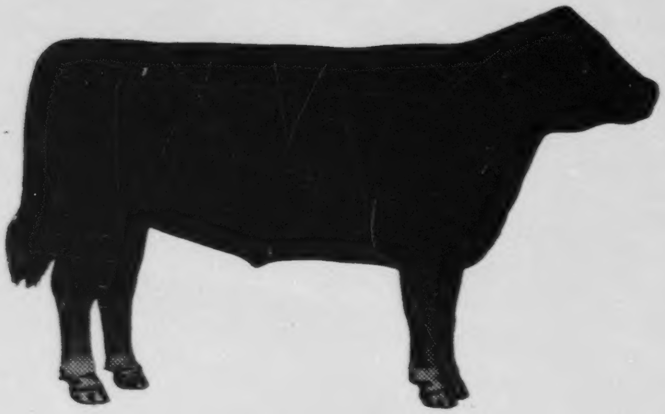
Deposit

Residue

Residue

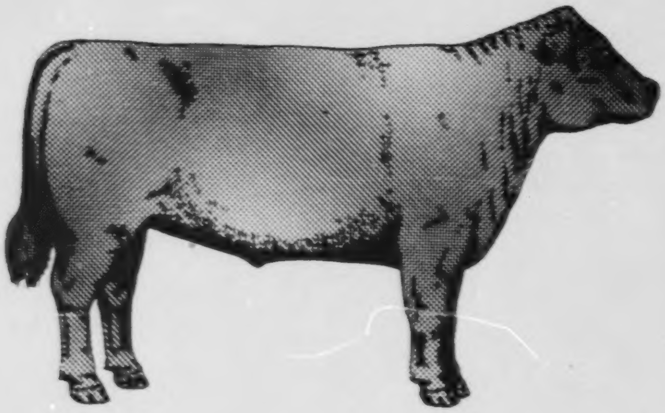
(Shading Denotes Pesticide Residue)

# Days to Slaughter



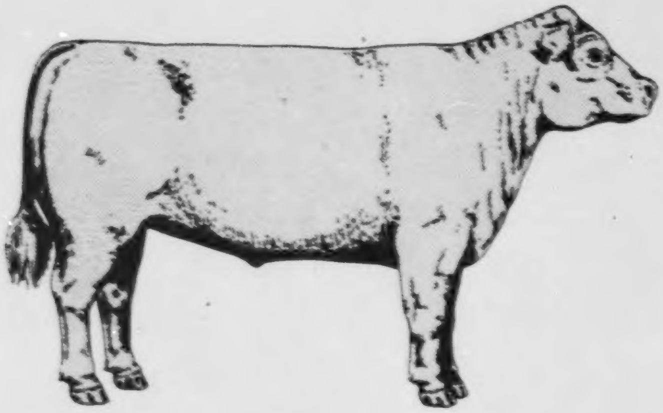
Deposit

At Application



Residue

5 Days
After Application

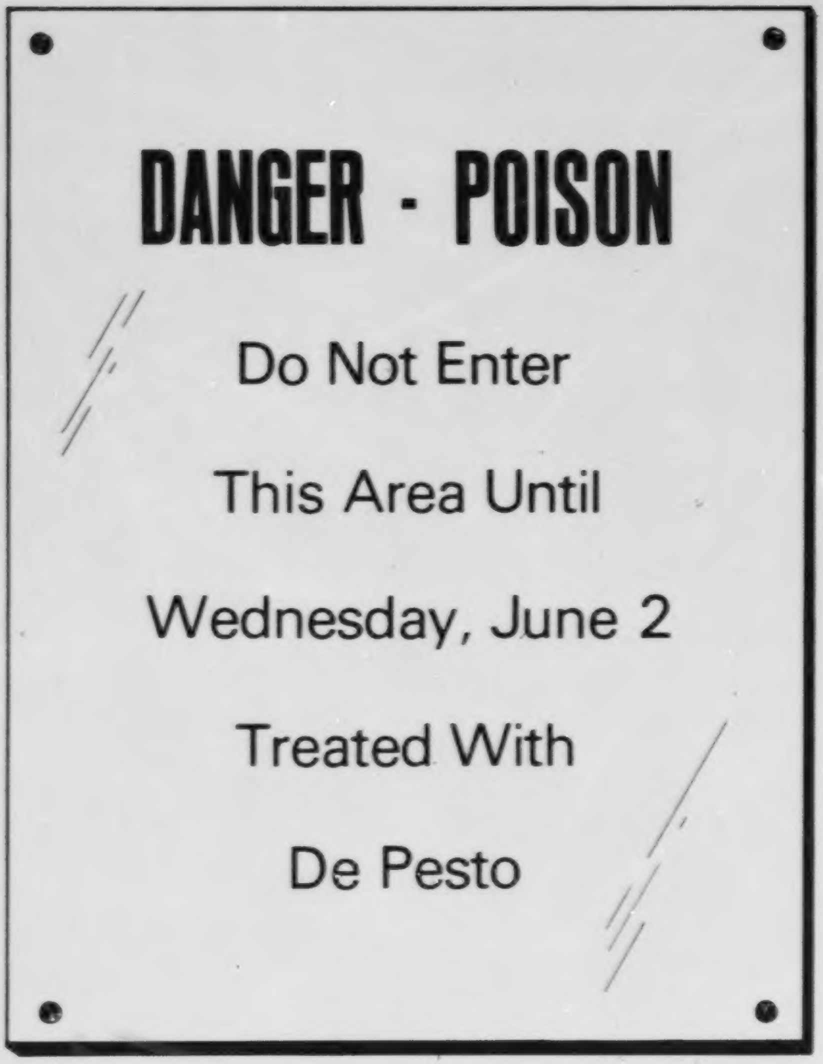


Residue

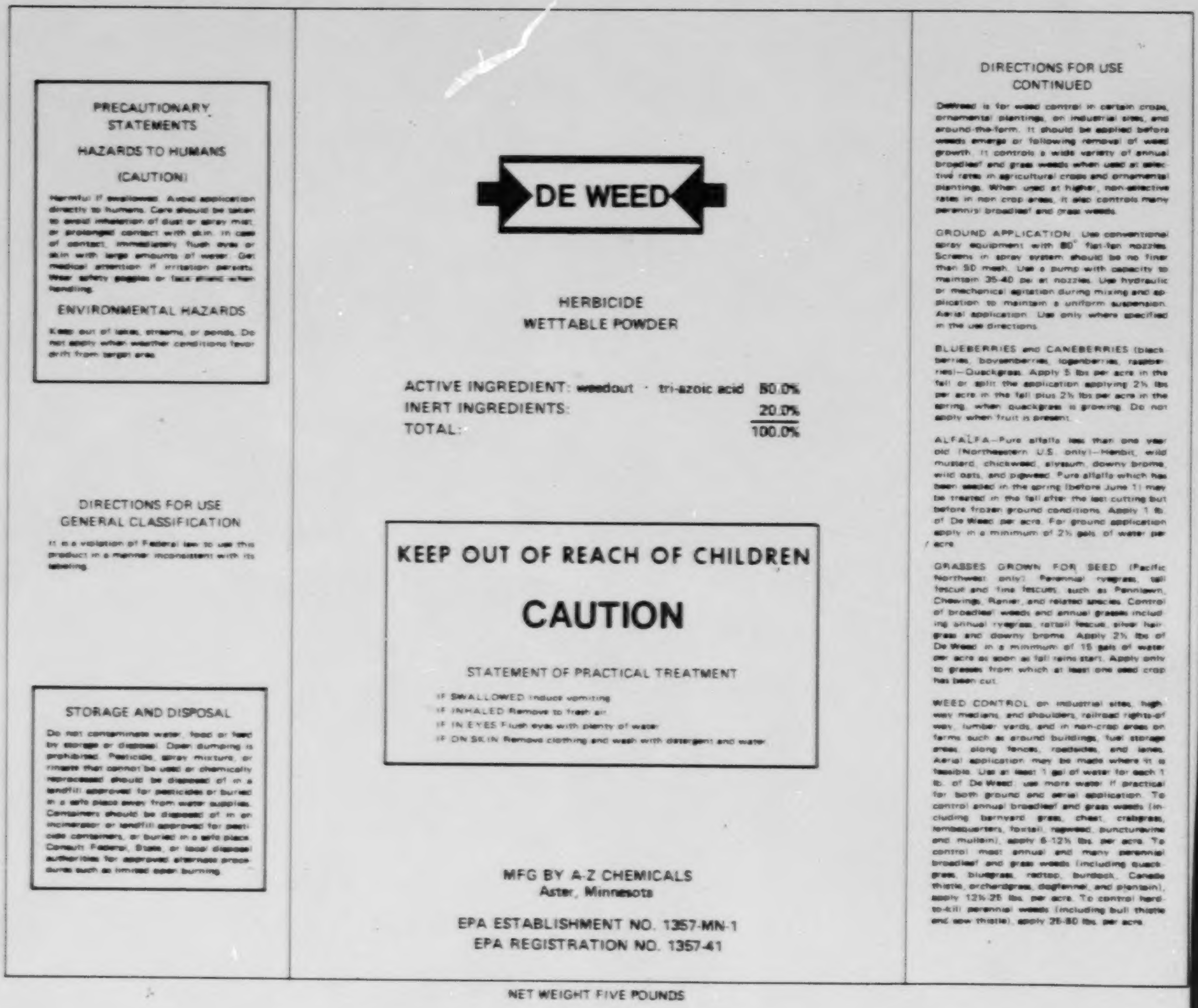
Slaughter Day
At or Below Tolerance

(Shading Denotes
Pesticide Residue)

# Reentry Sign


DANGER - POISON
Do Not Enter
This Area Until
Wednesday, June 2
Treated With
De Pesto

# Future General Use Pesticide Label



## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

(CAUTION)

Harmful if swallowed. Avoid application directly to humans. Care should be taken to avoid inhalation of dust or spray mist, or prolonged contact with skin. In case of contact, immediately flush eyes or skin with large amounts of water. Get medical attention if irritation persists. Wear safety goggles or face shield when handling.

### ENVIRONMENTAL HAZARDS

Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from target area.

## DIRECTIONS FOR USE GENERAL CLASSIFICATION

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be disposed of in an incinerator or landfill approved for pesticide containers, or buried in a safe place. Consult Federal, State, or local disposal authorities for approved alternate procedures such as limited open burning.

**DE WEED**

HERBICIDE
WETTABLE POWDER

| | |
|---|---|
| ACTIVE INGREDIENT: weedout · tri-azoic acid | 80.0% |
| INERT INGREDIENTS: | 20.0% |
| TOTAL: | 100.0% |

KEEP OUT OF REACH OF CHILDREN

## CAUTION

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED Induce vomiting
IF INHALED Remove to fresh air
IF IN EYES Flush eyes with plenty of water
IF ON SKIN Remove clothing and wash with detergent and water

MFG BY A-Z CHEMICALS
Aster, Minnesota

EPA ESTABLISHMENT NO. 1357-MN-1
EPA REGISTRATION NO. 1357-41

## DIRECTIONS FOR USE CONTINUED

DeWeed is for weed control in certain crops, ornamental plantings, on industrial sites, and around-the-farm. It should be applied before weeds emerge or following removal of weed growth. It controls a wide variety of annual broadleaf and grass weeds when used at selective rates in agricultural crops and ornamental plantings. When used at higher, non-selective rates in non crop areas, it also controls many perennial broadleaf and grass weeds.

GROUND APPLICATION. Use conventional spray equipment with 80° flat-fan nozzles. Screens in spray system should be no finer than 50 mesh. Use a pump with capacity to maintain 35-40 psi at nozzles. Use hydraulic or mechanical agitation during mixing and application to maintain a uniform suspension. Aerial application. Use only where specified in the use directions.

BLUEBERRIES and CANEBERRIES (blackberries, boysenberries, loganberries, raspberries)—Quackgrass. Apply 5 lbs per acre in the fall or split the application applying 2½ lbs per acre in the fall plus 2½ lbs per acre in the spring, when quackgrass is growing. Do not apply when fruit is present.

ALFALFA—Pure alfalfa less than one year old (Northeastern U.S. only)—Henbit, wild mustard, chickweed, alyssum, downy brome, wild oats, and pigweed. Pure alfalfa which has been seeded in the spring (before June 1) may be treated in the fall after the last cutting but before frozen ground conditions. Apply 1 lb. of De Weed per acre. For ground application apply in a minimum of 2½ gals. of water per acre.

GRASSES GROWN FOR SEED (Pacific Northwest only) Perennial ryegrass, tall fescue and fine fescues, such as Pennlawn, Chewings, Renier, and related species. Control of broadleaf weeds and annual grasses including annual ryegrass, rattail fescue, silver hairgrass and downy brome. Apply 2½ lbs of De Weed in a minimum of 15 gals of water per acre as soon as fall rains start. Apply only to grasses from which at least one seed crop has been cut.

WEED CONTROL on industrial sites, highway medians and shoulders, railroad rights-of-way, lumber yards, and in non-crop areas on farms such as around buildings, fuel storage areas, along fences, roadsides, and lanes. Aerial application may be made where it is feasible. Use at least 1 gal of water for each 1 lb. of De Weed; use more water if practical for both ground and aerial application. To control annual broadleaf and grass weeds (including barnyard grass, cheat, crabgrass, lambsquarters, foxtail, ragweed, puncturevine and mullein), apply 6-12½ lbs. per acre. To control most annual and many perennial broadleaf and grass weeds (including quackgrass, bluegrass, redtop, burdock, Canada thistle, orchardgrass, dogfennel, and plantain), apply 12½-25 lbs. per acre. To control hard-to-kill perennial weeds (including bull thistle and sow thistle), apply 25-50 lbs. per acre.

NET WEIGHT FIVE POUNDS

# Future Restricted Use Pesticide Label

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing. Wear tightly woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance, call 000-000-0000.

TO PHYSICIAN: De Pesto is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eye, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable! Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter within 48 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE: Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL: Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposed in approved landfill or buried in a safe place.

Consult Federal, State or local Disposal authorities for approved alternate procedures.

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

**DE PESTO**

INSECTICIDE
EMULSIFIABLE CONCENTRATE

| | |
|---|---|
| ACTIVE INGREDIENT: pestoff—tri-salicylic acid | 45.0% |
| INERT INGREDIENTS: | 55.0% |
| TOTAL: | 100.0% |

THIS PRODUCT CONTAINS 4.0 LBS OF PESTOFF PER GALLON

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in a glass of warm water. Repeat until vomitus is clear. Call a physician immediately.

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and immediately wash skin with detergent and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
CHEMTON, NEVADA

EPA EST. NO. 1357-NV-1
EPA REGISTRATION NO. 1357-42

NET CONTENTS ONE GALLON

## DIRECTIONS FOR USE CONTINUED

METHODS OF APPLICATION: The minimum gallonage requirement is 10 gallons of finished spray per acre with ground equipment, 2 gallons per acre with aircraft.

ALFALFA: Air and Ground Application—Alfalfa Weevil Larvae, Egyptian Alfalfa Weevil Larvae, Pea Aphid, and in New York state for Snout Beetle control. Apply the amount of De Pesto indicated in the chart, when feeding is noticed or when insects appear. Alfalfa Weevil Adult—Apply 1-2 pints per acre when insects appear. Lygus Bugs—Apply 2 pints per acre prior to bloom. Observe the indicated number of days after application before cutting or grazing. Do not apply more than once per season. Apply only to field planted to pure stands of Alfalfa.

| Pints of De Pesto Per Acre | Do Not Cut or Graze Within.. |
|---|---|
| ½ | 7 days |
| 1 | 14 days |
| 2 | 28 days |

CORN FIELD: Ground Application—Corn Rootworms—Use 1½ pints of De Pesto per 13,000 linear feet (1 acre with 40 inch spacing). Apply, at planting, as a 7 inch band over the row or inject on each side of the row by mixing with water or liquid fertilizers. When De Pesto is used with liquid fertilizers, mix in the following way making sure that the mixture is physically compatible. Premix 1 part of De Pesto with 2 parts of water. Add this premix to the tank of fertilizer along with rinsings from the premixing container. Maintain agitation in the tank after mixing and during application. Do not mix until ready to use.

SUGARCANE: Sugarcane Borer—Apply 1-1½ pints De Pesto per acre using ground or aerial equipment. Check sugarcane fields weekly, beginning in early June and continuing through August. Make first application only after visible joints form and 5% or more of the plants are infested with young larvae feeding in or under the leaf sheath and which have not bored into the stalks. Repeat whenever field checks indicate the infestation exceeds 5%. Do not apply within 17 days of harvest. Do not use in Hawaii.

ORANGES, LEMONS, GRAPEFRUIT, and TANGELOS in Arizona and California: Air and Ground application—Citrus thrips—Apply De Pesto at ½ to 1 lb. per acre. Use sufficient water to obtain thorough coverage (5 to 15 gals/acre by air). Use the higher rate on severe infestations of thrips. Apply in the early spring before bloom when the new growth is about 3 to 6 inches long. Make additional applications as needed until the new fruit is walnut size. Application at petal fall may be critical to prevent fruit scarring. Applications during mid-summer to protect new growth on young trees are also recommended.

Do not apply within 3 days of harvest. Do not graze livestock in treated orchards for 10 days after treatment.

POTATO: Tuberworm, cabbage looper, aphids, and in areas east of the Mississippi River, leafhoppers and flea beetles. Apply De Pesto at indicated rates when field checks indicate the insect infestation is above 5%. Tuberworm, cabbage looper and aphid—apply ½ to 1 lb. per acre. Leafhopper and flea beetles—apply ½ lb. per acre. Do not apply within 14 days of harvest.

# LABELS AND LABELING
## UNIT V

## ASSIGNMENT SHEET #1-INTERPRET DE METHO LABEL

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read the label on the following page and then answer the questions below. When completed, return assignment sheet to instructor for evaluation.

1. Who was the manufacturer?

2. What letter(s) on the label identifies what chemical this product contains?

3. What is the percentage of active ingredients?

4. Which letter(s) on the label identifies approved uses?

5. Which letter(s) on the label identifies first aid treatment?

6. Which letter(s) on the label identifies directions to the physician?

7. Which letter(s) on the label identifies personal safety precautions?

8. Which letter(s) on the label identifies environmental warnings to user?

9. Which letter(s) on the label identifies storage and disposal procedures?

10. Which letter(s) on the label identifies directions for determining proper rates?

ASSIGNMENT SHEET #1

SPECIMEN

A

### PRECAUTIONARY STATEMENTS
### HAZARDS TO HUMANS
### (DANGER)

[illegible]

TO PHYSICIAN: De Metho is a [illegible] inhibitor. Do not use [illegible] such as 2-PAM. Give Atropine 2 mg. [illegible] [illegible] Close supervision of the patient is indicated for at least 48 hours.

B

### ENVIRONMENTAL HAZARDS

[illegible]

### PHYSICAL OR CHEMICAL HAZARDS

Flammable! Keep away from heat and open flame.

C

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within 24 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

D

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposal in approved landfill or buried in a safe place.

Contact Federal, State or local Disposal authorities for approved alternate procedures.

E

# RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY
CERTIFIED APPLICATORS OR PERSONS UNDER THEIR
DIRECT SUPERVISION

F

# DE METHO

INSECTICIDE

Emulsifiable Concentrate

G

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL | 24% |
| INERT INGREDIENTS: | 76% |
| TOTAL: | 100% |

**Net Content: 50 gallons**

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

H

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED - Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician imr

IF INHALED - Remove to fresh air. Call a physician immediately.

IF IN EYES - Flush eyes with plenty of water for at least 15 minut physician immediately.

IF ON SKIN - In case of contact, remove contaminated clothing and im wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL
PRECAUTIONARY STATEMENTS

I

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

ESTABLISHMENT NO. 1357-VT-1
EPA REGISTRATION NO. 1357-43

J

### DIRECTIONS FOR USE
### CONTINUED
### SPRAY PREPARATION

[illegible]

### APPLICATION

[illegible]

K

### NOTICE TO BUYER

[illegible]

[illegible]

### CROP USAGE

L

| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

[illegible]

## LABELS AND LABELING
## UNIT V

### ASSIGNMENT SHEET #2--INTERPRET DE METHO LABEL

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read the label on the next page and answer the questions below. When completed, return assignment sheet to instructor for evaluation.

1. What is the brand name?

2. What is the common name?

3. Why is there no chemical name?

4. When could you allow livestock to graze on the treated alfalfa?

5. How close to harvest could you spray the following crops?

   a. Cauliflower

   b. Tomatoes

6. If you sprayed sweetcorn on Monday, when is the first day you or your workers could safely reenter the field without wearing protective clothing?

7. What is the EPA registration number?

8. What is the EPA establishment number?

9. How much pesticide does this container hold?

10. What signal word is on this label?

11. For what toxicity category does the signal word stand?

12. Is it a general use or restricted use pesticide?

13. Who could use this pesticide?

ASSIGNMENT SHEET #2

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS

(DANGER)

[illegible]

TO PHYSICIAN: [illegible]

ENVIRONMENTAL HAZARDS

[illegible]

PHYSICAL OR CHEMICAL HAZARDS

Flammable: Keep away from heat and open flame.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within 24 hours after application.

CATEGORY OF APPLICATOR (IF APPLICABLE)

STORAGE AND DISPOSAL

STORAGE—[illegible] DISPOSAL—[illegible]

[illegible]

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

## DE METHO

INSECTICIDE

Emulsifiable Concentrate

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL — | 24% |
| INERT INGREDIENTS: | 76% |
| TOTAL: | 100% |

Net Content: 50 gallons

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

KEEP OUT OF REACH OF CHILDREN

DANGER — POISON

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED - Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician im

IF INHALED - Remove to fresh air. Call a physician immediately.

IF IN EYES - Flush eyes with plenty of water for at least 15 minut physician immediately.

IF ON SKIN - In case of contact, remove contaminated clothing and wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

ESTABLISHMENT NO. 1357-VT-1
EPA REGISTRATION NO. 1357-43

DIRECTIONS FOR USE CONTINUED

SPRAY PREPARATION

[illegible]

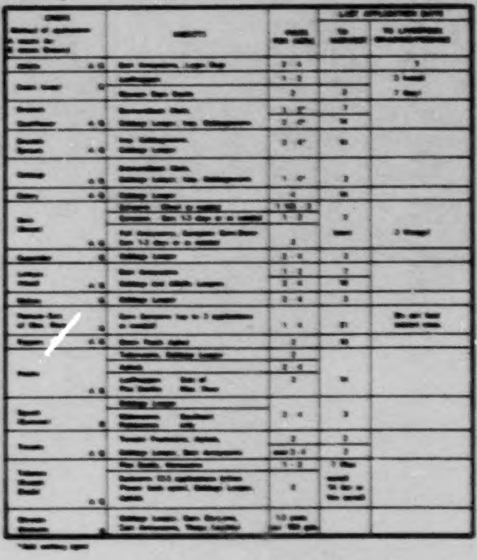
APPLICATION

[illegible]

NOTICE TO BUYER

[illegible]

CROP USAGE



SPECIMEN

## ASSIGNMENT SHEET #3--INTERPRET ANTI-WEED LABEL

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read the label on the following page and answer the questions below. When completed, return assignment sheet to instructor for evaluation.

1. Who was the manufacturer?

2. What is the brand name?

3. What is the common name?

4. What is the chemical name?

5. What is the percentage of active ingredients?

6. What is the signal word used on the label?

7. For what toxicity category does the signal word stand?

8. How much pesticide does this container hold?

9. What is the EPA registration number?

10. What is the EPA establishment number?

11. If you applied this to corn on Monday, when is the first day you could safely reenter the fields without wearing protective clothing?

12. If you applied it on June 1, when is the first day you could graze your livestock in that area?

13. Is this a restricted use or general use pesticide?

14. Is this pesticide flammable or corrosive?

## ASSIGNMENT SHEET #3

# Anti-Weed

# 20G

SAMPLE LABEL

## Herbicide

FOR WEED CONTROL
IN CORN

Active Ingredients:
Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . 20.0%
Inert Ingredients: 80.0%
Total: 100.0%

Anti-Weed 20G is a granular herbicide

**Warning:**

Keep out of reach of children. See additional warning statements on back of bag.

**50**
**Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

**KILL-DEAD**
**Chemical Company**
Chemical City, West Virginia

# ASSIGNMENT SHEET #3

## DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

**IMPORTANT**: Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

### Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of **Kill-Dead** or the Seller. All such risks shall be assumed by the Buyer.

**Kill-Dead** warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks referred to above. **Kill-Dead makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty.** In no case shall **Kill-Dead** or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. **Kill-Dead** and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of **Kill-Dead Chemical Company**.

### General Information

**Anti-Weed** will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since **Anti-Weed** acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

**Anti-Weed** is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using **Anti-Weed** where adjacent desirable trees, shrubs or plants might be injured.

Store **Anti-Weed** in a dry place.

**Application Instructions**

Broadcast or Overall Treatment

Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment

Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \text{Recommended Broadcast Rate} = \text{lbs./Acre Anti-Weed for Band Treatment}$$

**Range of Rates**: In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

### Directions for Use

**Anti-Weed** controls most annual broadleaf and grass weeds such as:

Giant Foxtail
Green Foxtail
Yellow Foxtail
Barnyardgrass (Watergrass)
Crabgrass
Fall Panicum
Annual Morningglory
Cocklebur
Sandbur
Jimsonweed
Lambsquarters
Mustard
Pigweed
Ragweed
Smartweed
Sunflower
Velvetleaf

**Anti-Weed** will not control perennial weeds such as:

Johnsongrass  Field Bindweed  Canada Thistle  Bull Nettle

Apply **Anti-Weed** at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| **Soil** | **Rate per acre of Anti-Weed Broadcast** |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs. |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–<br>30 lbs. |

*For calculation of band treatment rate, see Application Instructions Section.

** **Anti-Weed** should not be used on high organic soils such as peat and muck.

**Suggestions for Crop Rotations**

1) Corn may be replanted at any time following application of **Anti-Weed**. 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions**: 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following **Anti-Weed** application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

### Warning

Keep out of reach of children.

Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.

This product is toxic to fish. Keep out of lakes, ponds and streams.

Do not reuse container. Destroy when empty.

## ASSIGNMENT SHEET #4--INTERPRET NO-DISEASE LABEL

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read the label on the following page and answer the questions below. When completed, return assignment sheet to instructor for evaluation.

1. What is the brand name?

2. What is the common name?

3. What is the chemical name?

4. How much pesticide does this container hold?

5. If you plan to harvest your beans on Saturday but on Monday notice gray mold, could you spray with this? Why or why not?

6. How long would you have to wait after spraying to feed your cattle bean vines or hay?

7. When could workers reenter the fields after spraying without wearing protective clothing?

8. What is the signal word on the label?

9. For what toxicity category does the signal word stand?

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with.

**ALMONDS: Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half to full bloom.

**APPLES, PEARS:** Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP): White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH: Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII): Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES: Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS: Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 35 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL

# NO-DISEASE

## BENOMYL FUNGICIDE

**Wettable Powder**

| | |
|---|---|
| **ACTIVE INGREDIENT**<br>Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate] | 50% |
| **INERT INGREDIENTS** | 50% |

U.S. Pat. [illegible] EPA Est. 1352-WV-1 EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.
Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing. Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

**NET 50 LBS.**

B-21150 8-73A Made in U.S.A. Printed in U.S.A.

**KILL-DEAD CHEMICALS**
Chemical City, West Virginia

**PECANS: Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply
½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may b
added to the spray to improve wetting of foliage. Apply at prepollination whe
young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4
week intervals. Do not apply after shucks split.

**PINEAPPLE: Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. pe
100 gals. of water as preplant dip treatment. Immerse seedpieces to give thoroug
wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES,
PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per ac
with hydraulic ground equipment or equivalent amount of No-Disease
per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combina
tion with dormant oil) as a delayed dormant treatment prior to bud break. Use ½
lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom
apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional ap
plications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuc
fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 week
after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after har
vest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by Rhi
zopus spp. and **Alternaria** spp.

**STRAWBERRIES: Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Le
Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue a
10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per ac
when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin a
plication when disease first appears and repeat at 14- to 21-day intervals a
needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII): Pineapple Disease (Ceratocystis paradoxa)**—Ap
to cut seedpieces either as a cold dip or hot dip.

*Cold Dip*—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to g
thorough wetting; remove and allow to drain.

*Hot Dip*—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of t
dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to dra

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES (Powdery Mildew, Black Spot); FLOWERS, ORNAME
TALS (Powdery Mildew, Botrytis Gray Mold):** Field and Greenhouse—Use 8 o
per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, u
1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-
intervals throughout the growing season; shorten interval during humid, rainy weath
Addition of a surfactant to the spray mixture enhances curative action of the fu
cide, and improves distribution of the spray on hard-to-wet plants such as ro

**BULBS (Easter Lily, Tulip, Gladiolus, Daffodil, Iris): Fusarium and Penicilli
Rots**—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak clea
bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 ho
after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after b
have been heat cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to t
chemical description on the label thereof and is reasonably fit for purposes st
on such label only when used in accordance with directions under normal use c
ditions. This warranty does not extend to use of this product contrary to label
directions, or under abnormal use conditions, or under conditions not reasona
foreseeable to seller; buyer assumes all risk of any such use. Seller makes no ot
warranties, express or implied.
Purchase of this material does not confer any rights under patents of countr
outside of the United States.

## LABELS AND LABELING
## UNIT V

## ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. A-Z Chemicals
2. G
3. 24% (1.8 pounds per gallon)
4. L
5. H
6. A
7. A, C, H
8. B
9. D
10. J, L

Assignment Sheet #2

1. De Metho
2. methomyl
3. Does not have to appear if there is an approved common name
4. Seven days after application
5. a. Up to 14 days before
   b. Up to 1 day at 2 pints/acre or up to 2 days at over 2 pints/acre
6. 24 hours
7. 1357-43
8. 1357-VT-1
9. 50 gallons
10. Danger (Poison, Skull and Crossbones)
11. Highly toxic
12. Restricted use
13. Any certified pesticide applicator

Assignment Sheet #3

1. Kill-Dead
2. Anti-Weed
3. atrazine
4. 2-chloro-4-ethylamino-6-isopropylamino-s-triazine
5. 20%
6. Warning
7. Moderately toxic
8. 50 pounds
9. 1352-519
10. 1352-WV-1
11. As soon as any dust had settled on that Monday
12. On June 22
13. Unable to determine because new label has not yet come out, but the dealer can tell the applicator when he/she goes to buy this pesticide
14. No

Assignment Sheet #4

1. No-Disease
2. benomyl
3. Methyl I (butylcarbamoyl)-2-benzimidazolecarbamate
4. 50 lbs
5. No--14 days to harvest
6. Cannot feed the treated bean vines and hay to livestock
7. After the spray has dried on
8. Caution
9. Slightly toxic to relatively nontoxic

# LABELS AND LABELING
## UNIT V

## TEST

1. Match the terms on the right to the correct definitions on the left. Place the appropriate numbers in the blanks provided.

_____a. Poisonous; ability to cause injury to plants and animals, including humans

_____b. Technical information including the label and any other printed material provided by the manufacturer or its agent to accompany a pesticide product

_____c. Chemical or other substance that can cause injury or death when eaten, absorbed, or inhaled by plants or animals, including man

_____d. Words which must appear on pesticide labels to show toxicity of pesticide

_____e. Written material attached to or printed on a pesticide container or wrapper

_____f. Unwanted organism

_____g. Chemical or other substance that will prevent, repel, destroy, or control a pest or protect something from a pest

_____h. That part of a pesticide product which will kill or control pests or prevent damage by them

_____i. Period of time between a pesticide application and when workers may go back into an area without wearing protective clothing or equipment

1. Label
2. Signal words
3. Pesticide
4. Pest
5. Active ingredient
6. Toxic
7. Labeling
8. Poison
9. Reentry

2. Select from the list below those statements indicating when to read a label. Place an "X" in the appropriate blanks.

_____a. Before use or purchase

_____b. Before mixing

_____c. Before applying

_____d. Before transporting, storing, and disposing

3. Match the users of the labels on the right to the ways the labels are used on the left. An answer may be used more than once.

_____a. Use labels to control sale, use, safety, storage, and disposal of pesticides

_____b. Use labels as the license to sell a pesticide

_____c. Use labels to determine the antidote to use in the proper treatment of poisoning cases

_____d. Use labels as a way of deciding which pesticide will be effective against the pest and be the safest to use

_____e. Use labels to decide what safety precautions to take and how much pesticide to use

_____f. Use labels to aid in making recommendations to buyers and users

1. State and federal governments
2. Manufacturers of pesticides
3. Dealers and pest control experts
4. Buyers and users
5. Physicians

4. Select from the list below the agency in the federal government responsible for regulating sale and use of pesticides and registering labels.

_____a. U.S. Department of Agriculture

_____b. State Department of Agriculture

_____c. Environmental Protection Agency

_____d. Environmental Control Agency

5. Identify facts contained on a pesticide label by reading the following label and answering the questions below.

a. What is the brand name?

b. What is the common name?

c. Who is the manufacturer?

d. What is the chemical name?

e. Is the material a wettable powder, granular, or emulsifiable concentrate?

SAMPLE LABEL — FRONT PANEL

# NOMITE® 50W

## Miticide

**Wettable Powder Formulation**
**For Control of Plant-Feeding Mites**

| | |
|---|---|
| ACTIVE INGREDIENT | |
| Methylethylbutyl phos (metbutin) | 50.0% |
| INERT INGREDIENTS | 50.0% |

E.P.A. Registration No. 1576-491
E.P.A. Establishment No. 1576-NC-1

**POISON** ☠ **DANGER**

**DANGER:** KEEP OUT OF REACH OF CHILDREN
See other cautions on side panel

**THE MOW CHEMICAL COMPANY**
SNOWBALL, N.C. 27000

6. Match the terms on the right to the correct definitions on the left. Place the appropriate numbers in the blanks provided.

_____a. Well-known, made-up name accepted by the Environmental Protection Agency to identify the active ingredients in a pesticide

_____b. Scientific "often complicated" name which tells what the active ingredients are

_____c. Name used by a manufacturer to identify a pesticide as their product

1. Brand name
2. Common name
3. Chemical name

7. Match the signal words on the right to the toxicity categories on the left. Place the proper numbers in the blanks provided.

_____a. Highly toxic pesticides; the word *poison* printed in red and the skull and crossbones symbol are also required on labels of highly toxic pesticides

_____b. Slightly toxic to relatively nontoxic pesticides

_____c. Moderately toxic pesticides

1. Caution
2. Warning
3. Danger

8. Discuss in a short paragraph days to harvest and days to slaughter in the application of pesticides.

9. Discuss reentry regulations following application of pesticides.

10. Name the factors that form the basis for pesticide classification into general use or restricted use pesticides.

a.

b.

c.

in the blank indicating general use pesticide.

______a. Pesticide use that may cause damage in the environment or endanger the applicator or other persons even when label directions are followed

______b. Pesticide use that will not cause excessive damage in the environment or endanger the applicator or other persons when applied according to label directions

12. Interpret the De Pesto label on the next page by answering the following questions.

a. What is the common name?

b. If you applied this to control lygus bugs in alfalfa, how long would you have to wait before cutting or grazing?

c. How close to harvest could you spray potatoes?

d. If you sprayed corn on Wednesday, when is the first day workers could go back into the field without wearing protective clothing?

e. Who could buy this pesticide?

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing: Wear tightly woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance, call 000-000-0000.

TO PHYSICIAN: De Pesto is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eye, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable: Keep away from heat and open flame.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter within 48 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposed in approved landfill or buried in a safe place.

Consult Federal, State or local Disposal authorities for approved alternate procedures.

# RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

# DE PESTO

INSECTICIDE
EMULSIFIABLE CONCENTRATE

| | |
|---|---|
| ACTIVE INGREDIENT: pestoff—tri-salicylic acid | 45.0% |
| INERT INGREDIENTS: | 55.0% |
| TOTAL: | 100.0% |

THIS PRODUCT CONTAINS 4.0 LBS OF PESTOFF PER GALLON

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in a glass of warm water. Repeat until vomitus is clear. Call a physician immediately.

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and immediately wash skin with detergent and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
CHEMTON, NEVADA

EPA EST. NO. 1357-NV-1
EPA REGISTRATION NO. 1357-42

NET CONTENTS ONE GALLON

## DIRECTIONS FOR USE CONTINUED

METHODS OF APPLICATION: The minimum gallonage requirement is 10 gallons of finished spray per acre with ground equipment, 2 gallons per acre with aircraft.

ALFALFA: Air and Ground Application—Alfalfa Weevil Larvae, Egyptian Alfalfa Weevil Larvae, Pea Aphid, and in New York state for Snout Beetle control. Apply the amount of De Pesto indicated in the chart, when feeding is noticed or when insects appear. Alfalfa Weevil Adult—Apply 1/2 pints per acre when insects appear. Lygus Bugs—Apply 2 pints per acre prior to bloom. Observe the indicated number of days after application before cutting or grazing. Do not apply more than once per season. Apply only to fields planted to pure stands of Alfalfa.

| Pints of De Pesto Per Acre | Do Not Cut or Graze Within |
|---|---|
| ½ | 7 days |
| 1 | 14 days |
| 2 | 28 days |

CORN, FIELD: Ground Application—Corn Rootworms—Use 1½ pints of De Pesto per 13,000 linear feet (1 acre with 40 inch spacing). Apply, at planting, as a 7 inch band over the row or inject on each side of the row by mixing with water or liquid fertilizers. When De Pesto is used with liquid fertilizers, mix in the following way making sure that the mixture is physically compatible. Premix 1 part of De Pesto with 2 parts of water. Add this premix to the tank of fertilizer along with rinsings from the premixing container. Maintain agitation in the tank after mixing and during application. Do not mix until ready to use.

SUGARCANE: Sugarcane Borer—Apply 1-1½ pints De Pesto per acre using ground or aerial equipment. Check sugarcane fields weekly, beginning in early June and continuing through August. Make first application only after visible joints form and 5% or more of the plants are infested with young larvae feeding in or under the leaf sheath and which have not bored into the stalks. Repeat whenever field checks indicate the infestation exceeds 5%. Do not apply within 17 days of harvest. Do not use in Hawaii.

ORANGES, LEMONS, GRAPEFRUIT, and TANGELOS in Arizona and California: Air and Ground application—Citrus thrips—Apply De Pesto at ½ to 1 lb. per acre. Use sufficient water to obtain thorough coverage (5 to 15 gallons/acre by air). Use the higher rate on severe infestations of thrips. Apply in the early spring before bloom when the new growth is about 3 to 4 inches long. Make additional applications as needed until the new fruit is walnut size. Application at petal fall may be critical to prevent fruit scarring. Applications during mid-summer to protect new growth on young trees are also recommended.

Do not apply within 3 days of harvest. Do not graze livestock in treated orchards for 10 days after treatment.

POTATO: Tuberworm, cabbage looper, aphids, and in areas east of the Mississippi River, leafhoppers and flea beetles. Apply De Pesto at indicated rates when field checks indicate the insect infestation is above 5%. Tuberworm, cabbage looper and aphids—apply ½ to 1 lb. per acre. Leafhopper and flea beetles—apply ½ lb. per acre. Do not apply within 14 days of harvest.

## LABELS AND LABELING
## UNIT V

### ANSWERS TO TEST

1. a. 6
   b. 7
   c. 8
   d. 2
   e. 1
   f. 4
   g. 3
   h. 5
   i. 9
2. a, b, c, d
3. a. 1
   b. 2
   c. 5
   d. 4
   e. 4
   f. 3
4. c. Environmental Protection Agency
5. a. Nomite
   b. metbutin
   c. Mow Chemical Company
   d. Methylethylbutyl phos
   e. Wettable powder
6. a. 2
   b. 3
   c. 1
7. a. 3
   b. 1
   c. 2

8. Discussion should include:

   a. Residue amounts are determined and safe tolerances are set

   b. Least number of days between last pesticide application and harvest or slaughter are determined to remain under tolerance

   c. Days to harvest or slaughter are listed on the label

   d. Harvest or slaughter should not be attempted before time period is over

9. Discussion should include:

   a. Wait at least until the deposit has dried or the dust has settled before reentering the field, even with the least hazardous pesticides

   b. Follow reentry times on label

   c. Do not allow workers, children, or other persons to reenter the sprayed area until this time has passed

   d. Wear protective clothing and equipment if reentry must be made before time elapses

   e. Federal standards require that at least a hat, shoes and socks, and closely woven fabric coveralls with long sleeves and trouser legs (or long sleeved shirt and long legged trousers) be worn if early reentry must be made

10. a. Hazard of poisoning

    b. Way pesticide is used

    c. Effects on the environment

11. b

12. a. pestoff

    b. 28 days

    c. 15 days--Do not apply within 14 days of harvest

    d. Saturday

    e. Any certified pesticide applicator

# PERSONAL SAFETY AND FIRST AID
## UNIT VI

### TERMINAL OBJECTIVE

After completion of this unit, the student should be able to distinguish between acute and chronic poisoning and between when to induce or not to induce vomiting. The student should be able to name three common families of pesticides and one example of each family and name ways pesticides enter the body. The student should be able to match signal words to categories of toxicity, match degrees of poisoning to the signs and symptoms of poisoning, match pesticide first aid kit items to their uses, and interpret labels correctly. The student should be able to name basic first aid rules and distinguish between safe and unsafe pesticide practices by surveying a farm. This knowledge will be evidenced by scoring one hundred percent on the unit test.

### SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with personal safety and first aid to the correct definitions.
2. Distinguish between acute and chronic poisoning.
3. Discuss in a short paragraph the basis for signal words.
4. Match signal words to categories of toxicity.
5. Name three common families of pesticides and one example of each family.
6. Name the reasons for distinguishing between the families of pesticides.
7. Name three ways pesticides enter the body.
8. Name the most important routes of entry for pesticides.
9. Discuss in a short paragraph the cholinesterase test.
10. Name the causes of most pesticide poisoning.
11. Match degrees of poisoning to the signs and symptoms of poisoning caused by nerve poisons.
12. Select from a list the signs and symptoms of fumigant poisoning.

13. Name the basic first aid rules for poison on skin, chemical burns, poison in the eye, and inhaled poison.

14. Select from a list the most important first aid measure in case of poisoning.

15. Distinguish between when to induce vomiting and when not to induce vomiting.

16. Discuss in a short paragraph the procedure for inducing vomiting.

17. Name the symptoms of shock.

18. Name the steps to follow in case of pesticide poisoning.

19. Name the local hospital or poison control center that serves your area and that can provide emergency treatment for pesticide poisoning.

20. Match pesticide first aid kit items to their uses.

21. Distinguish between safe and unsafe pesticide practices by surveying a farm.

22. Interpret pesticide labels as they relate to personal safety and first aid.

# PERSONAL SAFETY AND FIRST AID
## UNIT VI

## SUGGESTED ACTIVITIES

I. Instructor:

   A. Provide student with objective sheet.

   B. Provide student with information and assignment sheets.

   C. Make transparencies.

   D. Collect chemical container labels for use in the classroom.

   E. Collect information related to pesticide poisoning and accidents.

   F. Discuss terminal and specific objectives.

   G. Discuss information and assignment sheets.

   (NOTE: If student does not have a farm to survey, assign him one.)

   H. Discuss safety information contained on labels.

   I. Have students assemble pesticide first aid kit.

   J. Ask students to role play various poisoning symptoms and accidents and allow remainder of class to describe proper first aid.

   K. Contact a trained medical person at the local hospital or poison control center that provides treatment for pesticide poisoning and ask the person to speak to the class.

   L. Have class make drawing of human form and mark areas which absorb pesticides most quickly.

   M. Give test.

II. Student:

   A. Read objective sheet.

   B. Study information sheet.

   C. Complete assignment sheets.

   (NOTE: If you do not live on a farm, check with one of your classmates or a farmer in your community.)

   D. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

   A. TM 1--Signal Words

   B. TM 2--Ways Pesticides Enter Body

IV. Assignment sheets

   A. Assignment Sheet #1--Distinguish Between Safe and Unsafe Pesticide Practices

   B. Assignment Sheet #2--Describe Treatments for Poisonings

V. Test

VI. Answers to test

# PERSONAL SAFETY AND FIRST AID
## UNIT VI

## INFORMATION SHEET

I. Terms and definitions

A. Antidote--Treatment given by a medically trained person to reduce the effects of pesticide poisoning

B. Absorb--To take a pesticide or other material into a plant, animal, or the soil

C. Acute poisoning--Poisoning which occurs after a single exposure to a pesticide

D. Chronic poisoning--Poisoning which occurs as a result of repeated exposures to pesticides over a period of time

E. Contact--To touch or be touched by

F. Dermal toxicity--How poisonous a pesticide is to man or animal when in contact with the skin

G. Dilute--To make a pesticide thinner or weaker by adding water, oil, or other material; to water down

H. First aid--First effort to help a victim of poisoning while medical help is on the way

I. Hazard--Risk of danger; chance that injury or harm will come to the applicator, other persons, plants, or animals

J. Inhalation--To take air into the lungs; to breath in

K. Inhalation toxicity--How poisonous a pesticide is to man or animal when breathed in through the lungs

L. $LC_{50}$--Concentration of a pesticide in the air which would kill half of a large number of test animals exposed to it

(NOTE: The lower the LC number value, the more poisonous the pesticide. It is often used as the measure of acute inhalation toxicity. *LC* stands for lethal concentration.)

M. $LD_{50}$--Dose or amount of a pesticide which would kill half of a large number of test animals if eaten or absorbed through the skin

(NOTE: The lower the LD number value, the more poisonous the pesticide. LD number values are the commonly used measures of acute oral or acute dermal toxicity. *LD* stands for lethal dose.)

N. Lethal--Deadly

O. Oral--Through the mouth

163

P. Shock--Severe reaction of the human body to a serious injury; can result in death if not treated

Q. Signs and symptoms--Warning that something is wrong

(NOTE: A sign is an outward signal of a disease or poisoning in a plant or animal, including humans. A symptom is a feeling of being sick.)

R. Toxicity--How poisonous a pesticide is to a living organism

S. Vomitus--Matter which is vomited

II. Acute versus chronic poisoning

A. Acute--Poisoning which occurs after a single exposure to a pesticide

B. Chronic--Poisoning which occurs as a result of repeated exposures to pesticides over a period of time

(NOTE: Signs and symptoms of acute and chronic poisoning may be the same.)

III. Basis for signal words (Transparency 1)

(NOTE: If any of these forms of toxicity is highly toxic, then the pesticide label must carry the signal word for highly toxic.)

A. Acute oral toxicity of the pesticide

B. Acute dermal toxicity of the pesticide

C. Acute inhalation toxicity of the pesticide

IV. Signal words and categories of toxicity

| Categories | Signal Word Required on The Label | Categories of Acute Toxicity | | | Probable Oral Lethal Dose for 150 lb. person |
|---|---|---|---|---|---|
| | | $LD_{50}$ | | $LC_{50}$ | |
| | | Oral mg/kg | Dermal | Inhalation mg/1 | |
| I Highly Toxic | DANGER (skull and crossbones POISON) | 0-50 | 0-200 | 0-0.2 | A few drops to a teaspoonful |
| II Moderately Toxic | WARNING | over 50 to 500 | over 200 to 2,000 | over 0.2 to 2.0 | Over one teaspoonful to one ounce |
| III Slightly Toxic | CAUTION | over 500 to 5,000 | over 2,000 to 20,000 | over 2.0 to 20 | Over one ounce to one pint or one pound |
| IV Relatively Nontoxic | CAUTION | over 5,000 | over 20,000 | over 20 | Over one pint or one pound |

(NOTE: A small child would be poisoned by much less pesticide than the 150 pound person in the example. Keep all pesticides out of the reach of children!)

## INFORMATION SHEET

V. Families of pesticides

(NOTE: These are three common families of insecticides which act as nerve poisons. Common names are not capitalized; brand [trade] names are capitalized.)

A. Organophosphates or organophosphorous

1. parathion
2. TEPP
3. Phosdrin
4. phorate (Thimet)
5. demeton (Systox)
6. Di-Syston
7. Guthion
8. phosphamidon
9. Monitor
10. malathion

(NOTE: Many of the organophosphates are highly toxic orally, dermally, and through inhalation. Some are only slightly toxic.)

B. Carbamates

1. aldicarb (Temik)
2. carbofuran (Furadan)
3. carbaryl (Sevin)
4. formetanate hydrochloride (Carzol)
5. methomyl (Lannate)

(NOTE: Many carbamates are only moderately or slightly toxic. However, some are highly toxic orally, dermally, and through inhalation.)

C. Chlorinated hydrocarbons or organochlorines

(NOTE: DDT, aldrin, dieldrin, chlordane, and heptachlor belong to this family. However, there may be fewer registered uses for agriculture in the future.)

1. endrin
2. lindane
3. methoxychlor
4. endosulfan (Thiodan)
5. dicofol (Kelthane)

(NOTE: Some chlorinated hydrocarbons are considered hazardous because they persist in the environment. Also, some are highly toxic dermally and orally.)

VI. Reasons for distinguishing between families of pesticides

A. Pesticides within a family cause the same kinds of poisoning

B. Pesticides within a family are sometimes similar in the hazards they cause

C. First aid and antidote for poisoning are the same within a family

VII. Ways pesticides enter the body (Transparency 2)

A. Oral

B. Dermal

C. Inhalation

VIII. Most important routes of entry for pesticides

A. Applicator--Dermal and inhalation

B. Small children--Oral and dermal

(NOTE: You can be poisoned no matter which way the pesticide enters your body. It may enter and poison you through all three routes of entry at the same time.)

IX. The cholinesterase test

A. Chemical cholinesterase is necessary for nervous system to function properly

(NOTE: Without this chemical the person will die.)

B. Carbamate and organophosphate pesticides attack cholinesterase in blood and make it useless

C. A simple blood test is used to determine cholinesterase level and measure pesticide exposure

# INFORMATION SHEET

X. Causes of most pesticide poisoning

   A. Careless practices

   B. Ignorance

      (NOTE: Learn safe procedures; it is for your own good.)

XI. Signs and symptoms of poisoning caused by nerve poisons

   (NOTE: Some nerve poisons are organophosphates, carbamates, and chlorinated hydrocarbons.)

   A. Mild

      1. Fatigue

      2. Headache

      3. Dizziness

      4. Blurred vision

      5. Too much sweating and salivation

      6. Nausea and vomiting

      7. Stomach cramps and diarrhea

   B. Moderate

      1. Unable to walk

      2. Weakness

      3. Chest discomfort

      4. Muscle twitches

      5. Constriction of pupil of the eye

      6. Earlier symptoms become more severe

   C. Severe

      1. Unconsciousness

      2. Severe constriction of pupil of eye

      3. Muscle twitches

4. Secretion from mouth and nose
5. Breathing difficulty
6. Fever
7. Intense heat

(NOTE: Unfortunately, all signs and symptoms of pesticide poisoning are not the same. The sickness may be mild or severe, depending on the pesticide and the amount absorbed. However, the pattern of illness caused by one family of pesticides is always the same. On the other hand, having some of the signs and symptoms does not always mean you have been poisoned. Other kinds of sickness may cause similar signs and symptoms. Headache and a feeling of being unwell, for example, may signal the start of many kinds of illness. It is the pattern of symptoms that makes it possible to tell one kind of sickness from another.)

XII. Signs and symptoms of fumigant poisoning

A. Person appears drunk

B. Poor coordination

C. Slurring words

D. Confusion

E. Sleepiness

(CAUTION: Do not let yourself or anyone else get dangerously sick before calling your doctor or going to a hospital. It is better to be too cautious than too late. Take the container and the label of the pesticide to the doctor.)

XIII. Basic first aid rules

A. Poison on skin

1. Act quickly
2. Remove contaminated clothing and drench skin with water
3. Cleanse skin and hair thoroughly with detergent and water

(NOTE: Liquid detergents and commercial cleansers are better than soap.)

4. Dry victim and wrap in blanket

(CAUTION: Do not allow pesticide to get on you while you are helping the victim.)

B. Chemical burn

1. Wash with large quantities of running water
2. Remove contaminated clothing
3. Cover burned area immediately with loose, clean, soft cloth

   (NOTE: Do not apply ointments, greases, powders, or other drugs in first aid treatment of burns.)

C. Poison in eye

1. Wash eye quickly but gently
2. Hold eyelid open and wash with gentle stream of clean running water
3. Wash for 15 minutes or more

   (CAUTION: Do not use chemicals or drugs in the wash water. They may increase the extent of the injury.)

D. Inhaled poison

(NOTE: If patient is in an enclosed area, do not enter without proper protective clothing and equipment. If proper clothing is not available, call for emergency equipment from your fire department.)

1. Carry victim to fresh air immediately
2. Get victim to a doctor
3. Open all doors and windows so no one else will be poisoned
4. Loosen tight clothing
5. Apply artificial respiration if breathing has stopped or is irregular
6. Keep victim as quiet as possible
7. Prevent chilling

   (NOTE: An important step in good first aid is to call the doctor. It is the initial effort to help a victim while medical help is on the way that is important. Before going to call for emergency help if you are alone with the victim, make sure that the victim is breathing and that he/she is not further exposed. Always save the pesticide label for the doctor.)

## INFORMATION SHEET

XIV. Most important first aid measure--Remove or dilute the pesticide with water

XV. When to induce or not to induce vomiting

A. Read the label for instructions

B. Never induce vomiting

1. If the victim is unconscious or is in convulsions

2. If the victim has swallowed a corrosive poison

(NOTE: A corrosive poison is a strong acid or alkali. A corrosive poison will burn the throat and mouth as severely coming up as it did going down. It may also get into the lungs and cause severe damage there also.)

3. If the victim has swallowed emulsifiable concentrate or oil solutions

(NOTE: Emulsifiable concentrates and oil solutions cause severe damage to the lungs if vomited.)

C. Induce vomiting--Only if the label or a trained medical person tells you to

XVI. Procedure for inducing vomiting

A. Position victim face down or kneeling forward

(CAUTION: Do not allow victim to lie on his back because the vomitus could enter the lungs and cause severe damage.)

B. Give victim large amounts of milk or water

(NOTE: One to two cups should be given to a victim up to five years of age and up to a quart for victims five years of age and older.)

C. Put finger or the blunt end of a spoon at the back of victim's throat or have victim drink a glass of very salty water

(CAUTION: Do not use anything which is sharp or pointed.)

D. Collect some of the vomitus for doctor if you do not know what the poison is

(NOTE: In any poisoning emergency, think first of water. Your first aim is to remove the pesticide no matter where it is. Then get the victim to a doctor fast.)

XVII. Symptoms of shock

A. Skin pale, moist, cold, and clammy

B. Eyes vacant with dilated pupils

C. Breathing shallow and irregular

D. Pulse weak, rapid, and irregular

XVIII. Steps to follow in case of pesticide poisoning

A. Call doctor or take victim to the doctor or hospital

B. Check to see if patient is breathing

C. Locate pesticide label and have available for doctor

XIX. Local hospital or poison control center that serves your area and that can provide emergency treatment for pesticide poisoning

A. City ________________________________ Address ______________

B. Telephone: Area Code ___________ Number ____________________

(NOTE: Make sure your doctor has the number of the poison center.)

XX. Contents of pesticide first aid kit and their uses

A. Plastic bottle of detergent--Used to wash pesticides quickly off the skin

B. Plastic container of salt--Used to induce vomiting and to aid a person in shock

C. Bag of activated charcoal--When mixed with water and swallowed acts as an absorber of all pesticides

D. Shaped plastic airway--Used for mouth-to-mouth resuscitation

E. Plastic bottle of clean water--Used for diluting the salt

F. Band-aids, bandages, and tape--Used for wrapping cuts and scrapes and for protecting burns

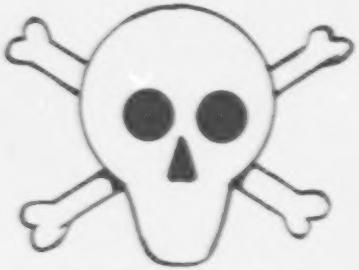
G. Blanket--Used for covering a victim

H. Coins--Used for emergency phone calls

I. Clean empty jar--Used as a drinking glass or for collecting vomitus

# Signal Words

**DANGER**



**POISON**

Highly Toxic

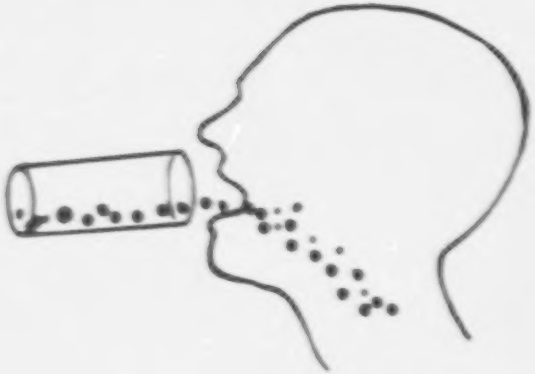
**WARNING**

Moderately Toxic

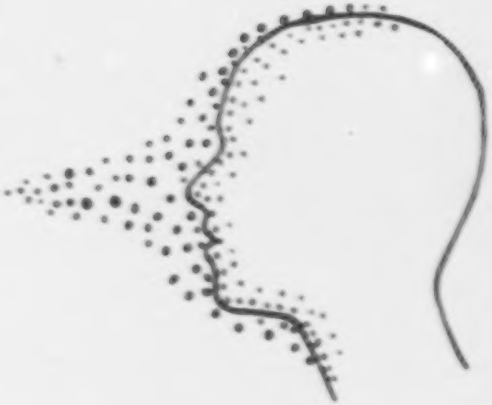
**CAUTION**

Slightly Toxic to
Relatively Nontoxic

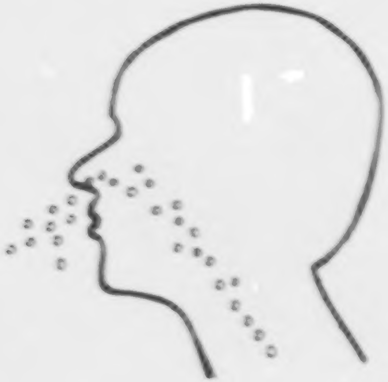
# Ways Pesticides Enter Body



Oral



Dermal



Inhalation

TM 2

## PERSONAL SAFETY AND FIRST AID
## UNIT VI

### ASSIGNMENT SHEET #1--DISTINGUISH BETWEEN SAFE AND UNSAFE PESTICIDE PRACTICES

Everyone can improve his methods of handling pesticides. Each year many accidents occur because of improper and careless handling of pesticides. How do you stand? Are you following safe practices? Check yourself by answering the following questions as you are surveying a farm. Remember that one "NO" may be what gets you in trouble. When you have answered all the questions, return the assignment sheet to your instructor for evaluation.

| STORE YOUR PESTICIDES SAFELY | Yes | No |
|---|---|---|
| Do you have a separate space to store pesticides? | ☐ | ☐ |
| Do you keep it locked and are the windows tight, barred, or boarded over? | ☐ | ☐ |
| Do you keep all your pesticides in this storage rather than in the garage, feed room, basement, porch, kitchen, or refrigerator? | ☐ | ☐ |
| Do you store herbicides separately from other pesticides? | ☐ | ☐ |
| Are there signs on your storage so firemen and others are warned? | ☐ | ☐ |
| Do you check periodically for leaking containers? | ☐ | ☐ |
| **KEEP IN THE ORIGINAL CONTAINER SO THE LABEL IS THERE!** | | |
| Do you always keep pesticides in the original container instead of old "coke" bottles, milk cartons, or other food containers? | ☐ | ☐ |
| When people ask you for a little spray mix out of your tank do you refuse? | ☐ | ☐ |
| Do you always remember what is in an unlabeled container? | ☐ | ☐ |
| Do you always remember the safety precautions, antidotes, and directions for use, even though the container is not labeled? | ☐ | ☐ |
| Do you safely dispose of unlabeled pesticides, rather than take a chance with your memory? | ☐ | ☐ |

## USE THE RECOMMENDED CLOTHING AND PROTECTIVE EQUIPMENT

| | Yes | No |
|---|---|---|
| Do you read the label to see what protective clothing you should wear? | ☐ | ☐ |
| Do you start each spraying day with clean spray clothing? | ☐ | ☐ |
| Do you check the signal word and precautions for use on the label to see what protective equipment is necessary? | ☐ | ☐ |
| Do you wear the protective equipment recommended on the label? | ☐ | ☐ |
| Do you clean and maintain your protective equipment regularly and often? | ☐ | ☐ |
| Do you throw away rubber gloves that have only tiny holes in them? | ☐ | ☐ |

## SPILLS AND SPLASHES OF CONCENTRATES CAN BE VERY HAZARDOUS!

| | | |
|---|---|---|
| Do you know what to do if you should spill a pesticide on yourself while mixing? | ☐ | ☐ |
| Do you wear adequate footgear with your pant cuffs on the outside so pesticides won't run into your footgear? | ☐ | ☐ |
| Do you have sawdust, vermiculite, kitty litter, or some other absorbent on hand to soak up spills? | ☐ | ☐ |
| Do you always watch your sprayer tank when filling so it won't run over and spill on the ground? | ☐ | ☐ |
| Do you have a check valve or other device on your equipment to prevent back-siphoning into the water supply? | ☐ | ☐ |
| Is your application equipment well maintained so it doesn't leak and leave toxic puddles or piles of pesticide on the ground? | ☐ | ☐ |
| Do you avoid draining leftover spray mix on the ground? | ☐ | ☐ |
| Do you discard old high pressure hose instead of patching it and hoping no one will be nearby when it bursts? | ☐ | ☐ |
| Do you clean nozzles with a brush or by rinsing instead of blowing them out with your mouth? | ☐ | ☐ |

| POOR CONTAINER DISPOSAL MAY CAUSE BAD ACCIDENTS! | Yes | No |
|---|---|---|
| Do you rinse each "empty" liquid container at least three times and dump the rinsings into the tank? | ☐ | ☐ |
| Do you keep your used containers in your storage area until disposed? | ☐ | ☐ |
| Do you collect every container for disposal before leaving a job instead of leaving them in the field or at your tank filling station? | ☐ | ☐ |
| Do you puncture, break, or crush nonburnable containers so they can't be reused? | ☐ | ☐ |
| Do you keep or return to the manufacturer 30 and 55 gallon pesticide drums, rather than giving them away for floats or trash barrels? | ☐ | ☐ |
| ATTRACTIVE NUISANCES CAN RESULT IN LAWSUITS! | | |
| Do you keep your spray equipment where children cannot play on it? | ☐ | ☐ |
| Do you keep your spray equipment clean so that those touching it will not be contaminated? | ☐ | ☐ |
| Do you always release pressure on your equipment so spray guns won't be accidentally triggered? | ☐ | ☐ |
| CARE IN APPLICATION PREVENTS ACCIDENTS | | |
| Do you check the wind direction and the area downwind before applying pesticides? | ☐ | ☐ |
| Do you consider substituting a safer chemical if you are spraying near a sensitive area? | ☐ | ☐ |
| Do you check for the possibility of showers and damaging runoff before applying pesticides? | ☐ | ☐ |
| Do you plan your pesticide application so it will have little or no effect on bees, birds, fish, or other wildlife? | ☐ | ☐ |
| Do you remove, turn over, or cover up pet dishes, sand boxes, and plastic pools before spraying private property? | ☐ | ☐ |
| Do you make sure that children and pets are out of the area and stay out until the spray dries? | ☐ | ☐ |
| Do you use the least toxic pesticide that will control the known pest, if all other factors are equal? | ☐ | ☐ |

# PERSONAL SAFETY AND FIRST AID
## UNIT VI

## ASSIGNMENT SHEET #2–DESCRIBE TREATMENTS FOR POISONINGS

Listed below you will find several imaginary cases of poisoning. The purpose of this assignment is to determine if you have the ability and knowledge of describing the necessary treatment of each one. After completion of this assignment turn in to instructor for evaluation.

1. Your sister has told you that she will be spraying in the southwest cotton fields all morning. When she doesn't appear for lunch, you and a friend drive out and find her lying in the field. She is vomiting, is unable to walk, has pinpoint pupils, and her muscles are twitching.

   a. By what route(s) of entry was your sister probably poisoned?

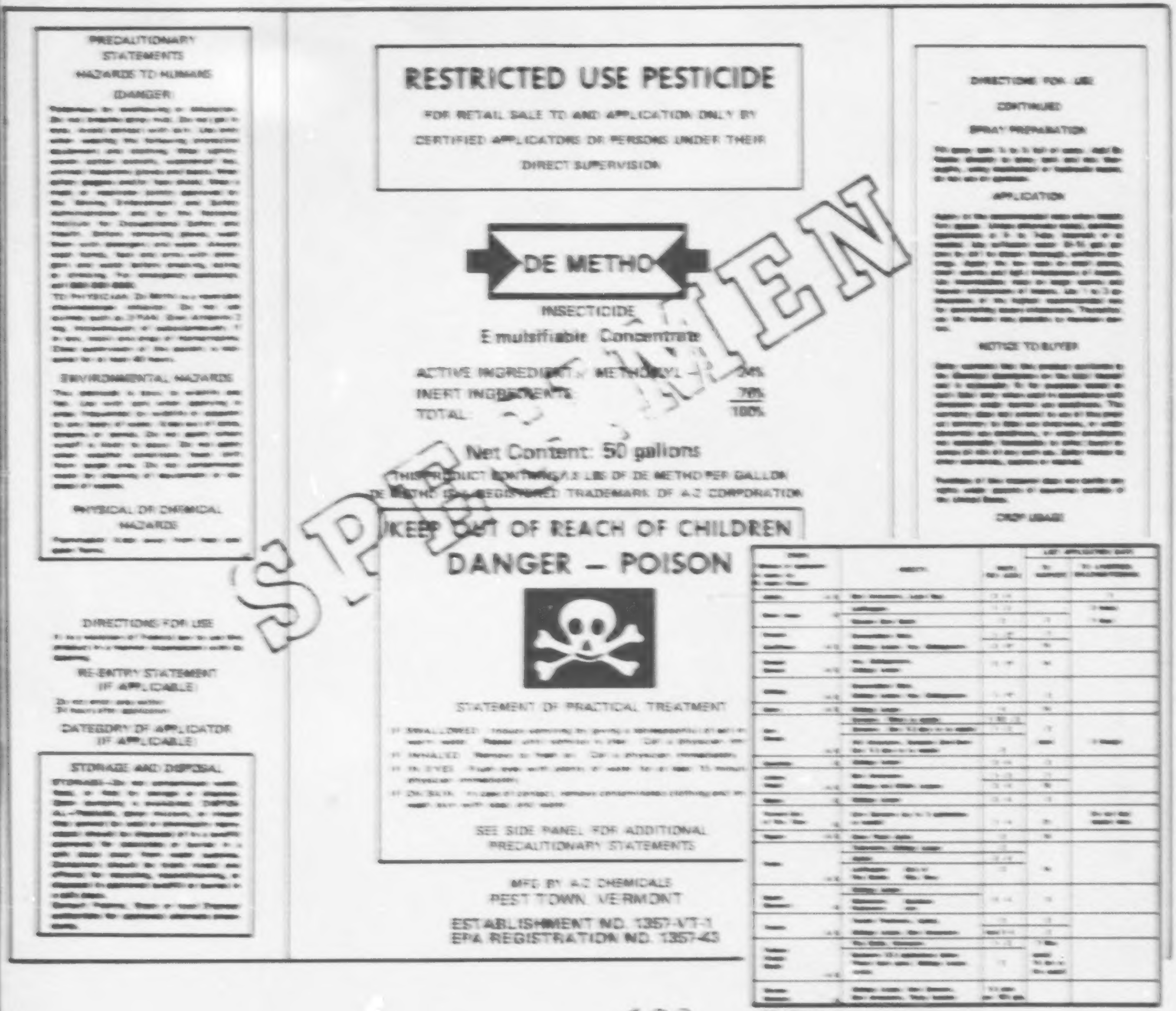
   b. What would you do?

2. Your little brother is crying and screaming on the floor of the mixing area. You notice a bottle of De Metho next to him and see traces of it on his mouth and tongue. You are alone at the time.

   (NOTE: Use the De Metho label on the following page.)

   a. By which route(s) of entry was your brother probably poisoned?

   b. What do you do?



PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS

(DANGER)

[illegible]

TO PHYSICIAN: [illegible]

ENVIRONMENTAL HAZARDS

[illegible]

PHYSICAL OR CHEMICAL HAZARDS

[illegible]

DIRECTIONS FOR USE

[illegible]

RE-ENTRY STATEMENT (IF APPLICABLE)

[illegible]

CATEGORY OF APPLICATOR (IF APPLICABLE)

STORAGE AND DISPOSAL

STORAGE—[illegible]

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

## DE METHO

INSECTICIDE

Emulsifiable Concentrate

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL — | 24% |
| INERT INGREDIENTS | 76% |
| TOTAL | 100% |

Net Content: 50 gallons

THIS PRODUCT CONTAINS [illegible] LBS OF DE METHO PER GALLON
DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: [illegible]

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: [illegible]

IF ON SKIN: [illegible]

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFD BY A-Z CHEMICALS
PEST TOWN, VERMONT

ESTABLISHMENT NO. 1357-VT-1
EPA REGISTRATION NO. 1357-43

DIRECTIONS FOR USE

CONTINUED

SPRAY PREPARATION

[illegible]

APPLICATION

[illegible]

NOTICE TO BUYER

[illegible]

CROP USAGE

ASSIGNMENT SHEET #2

# ASSIGNMENT SHEET #2

3. Your hired man is treating a grain silo. You come by to check on him and he talks strangely and seems confused by your questions. He tells you that he wants to take a nap before finishing the job.

   a. What type of poisoning do you think he probably received?

   b. What do you do?

4. You have been spraying with phosphamidon and phorate for the past couple of weeks. Today, however, you were just working in a field which you recently sprayed. Now you have a headache and seem very dizzy. You are sweating, having severe stomach cramps, and beginning to vomit. You feel weak all over.

   a. What type of poisoning do you think you have?

   b. What should you do?

## ANSWERS TO ASSIGNMENT SHEET #2

1. a. Dermal and inhalation

   b. Get her and you out of the area fast. Send your friend to call a doctor and/or ambulance. Meanwhile, get your sister to fresh air and take off her spray clothes and equipment. Wrap her in a blanket. If any chemical has soaked through to the skin, get her into a shower, pond, or other water source and wash the chemical off with detergent and water. Ask your friend to try to find the container and label of the pesticide being used. Keep her quiet until help arrives or wrap her in a blanket and take her and the pesticide label to the hospital.

2. a. Oral

   b. Get him and you out of the area fast. Take the container and label with you. The label says to induce vomiting by giving a teaspoon of salt in a glass of warm water. Keep giving your brother this until the vomitus is clear. Keep him on his knees leaning forward the whole time. Then get a large glass of cream or milk and try to get it down him. Call the doctor or ambulance. If any of the pesticide remains on his hands, mouth, clothing, or body, wash it off with detergent and water. Wrap him in a warm blanket and take him to the hospital or wait for the ambulance.

3. a. Acute fumigant

   b. Yell for help and have somebody nearby call the doctor. Put on an air supplied respirator before going in after him. Get you and your buddy to fresh air immediately. If you have oxygen available (air supplied respirator), give him some. Make sure he is breathing. Remove all of his clothing and if necessary wash him with detergent and water. Wrap him in a warm blanket. Have someone get the pesticide and label that he was using. Wait for ambulance or get victim and pesticide label to the hospital.

4. a. Chronic organophosphate

   b. Have someone drive you to the hospital or call an ambulance. Take along the labels which you have been using recently. Ask them to check your blood cholinesterase level.

## PERSONAL SAFETY AND FIRST AID
## UNIT VI

## TEST

1. Match the terms on the right to the correct definitions on the left by placing the appropriate numbers in the blanks provided.

______a. Treatment given by a medically trained person to reduce the effects of pesticide poisoning

______b. Through the mouth

______c. Matter which is vomited

______d. To take a pesticide or other material into a plant, animal, or the soil

______e. How poisonous a pesticide is to a living organism

______f. Deadly

______g. Severe reaction of the human body to a serious injury; can result in death if not treated

______h. Poisoning which occurs after a single exposure to a pesticide

______i. Dose or amount of a pesticide which would kill half of a large number of test animals if eaten or absorbed through the skin

______j. Poisoning which occurs as a result of repeated exposures to pesticides over a period of time

______k. Concentration of a pesticide in the air which would kill half of a large number of test animals exposed to it

______l. To touch or be touched by

______m. How poisonous a pesticide is to man or animal when breathed in through the lungs

______n. How poisonous a pesticide is to man or animal when in contact with the skin

______o. Risk of danger; chance that injury or harm will come to the applicator, other persons, plants, or animals

1. Inhalation
2. Inhalation toxicity
3. $LC_{50}$
4. $LD_{50}$
5. Lethal
6. Oral
7. Vomitus
8. Shock
9. Signs and symptoms
10. Toxicity
11. Antidote
12. Dilute
13. Absorb
14. Dermal toxicity
15. Acute poisoning
16. Contact
17. Chronic poisoning
18. First aid
19. Hazard

______p. To take air into the lungs; to breathe in

______q. To make a pesticide thinner or weaker by adding water, oil, or other material; to water down

______r. First effort to help a victim of poisoning while medical help is on the way

______s. Warning that something is wrong

2. Distinguish between acute and chronic poisoning by placing an "X" in front of the statement representing chronic poisoning.

______a. Poisoning which occurs after a single exposure to a pesticide

______b. Poisoning which occurs as a result of repeated exposures to pesticides over a period of time

3. Discuss in a short paragraph the basis for signal words.

4. Match signal words on the right to the categories of toxicity on the left. Answers may be used more than once in a blank.

______a. Moderately toxic

______b. Slightly toxic

______c. Highly toxic

______d. Relatively nontoxic

1. Danger (Skull and Crossbones, Poison)
2. Warning
3. Caution

5. Name three common families of pesticides and one example of each family.

a.

b.

c.

6. Name the reasons for distinguishing between the families of pesticides.

a.

b.

c.

7. Name three ways pesticides enter the body.

a.

b.

c.

8. Name the most important routes of entry for pesticides.

a. Applicator--

b. Small children--

9. Discuss in a short paragraph the cholinesterase test.

10. Name the causes of most pesticide poisoning.

a.

b.

11. Match the degrees of poisoning on the right to the signs and symptoms of nerve poisoning on the left. Answers may be used more than once in a blank.

______a. Headache
______b. Muscle twitches
______c. Unable to walk
______d. Fever
______e. Blurred vision
______f. Constriction of pupil of the eye
______g. Chest discomfort
______h. Nausea and vomiting
______i. Intense heat
______j. Stomach cramps and diarrhea
______k. Secretion from mouth and nose
______l. Unconsciousness

1. Mild
2. Moderate
3. Severe

12. Select from the list below signs and symptoms of fumigant poisoning. Place an "X" in the appropriate blanks.

______a. Confusion

______b. Vomiting

______c. Sweating

______d. Poor coordination

______e. Sleepiness

______f. Slurring words

______g. Wants to fight

______h. Person appears drunk

13. Name the basic first aid rules for the following types of poisoning

a. Poison on skin

b. Chemical burn

c. Poison in eye

d. Inhaled poison

14. Select from the list below the most important first aid measure in case of poisoning.

______a. Antidote

______b. Remove or dilute the pesticide with water

______c. Detergent

______d. Commercial chemicals

15. Distinguish between when to induce vomiting and when not to induce vomiting by answering the following statements "Yes" or "No."

______a. Victim swallowed an emulsifiable concentrate or oil solution

______b. Label tells you to

______c. Victim swallowed a corrosive poison

______d. Trained medical person instructs you to

16. Discuss in a short paragraph the procedure for inducing vomiting.

17. Name the symptoms of shock.

a.

b.

c.

d.

18. Name the steps to follow in case of pesticide poisoning.

a.

b.

c.

19. Name the local hospital or poison control center that serves your area and that can provide emergency treatment for pesticide poisoning.

20. Match the pesticide first aid kit items on the right to their uses on the left. Place the correct numbers in the blanks.

______a. Used as a drinking glass or for collecting vomitus

______b. Used to wash pesticides quickly off the skin

______c. Used for emergency phone calls

______d. Used to induce vomiting and to aid a person in shock

______e. Used for covering a victim

______f. Used for wrapping cuts and scrapes and for protecting burns

______g. Used for diluting the salt

______h. Used for mouth-to-mouth resuscitation

______i. When mixed with water and swallowed acts as an absorber of all pesticides

1. Bag of activated charcoal
2. Plastic bottle of detergent
3. Clean empty jar
4. Shaped plastic airway
5. Plastic container of salt
6. Coins
7. Plastic bottle of clean water
8. Band-aids, bandages, and tape
9. Blanket

21. Distinguish between safe and unsafe pesticide practices by surveying a farm.

(NOTE: If the above activity has not been accomplished prior to the test, ask your instructor when it should be completed.)

22. Interpret the following De Pesto label correctly by answering the questions below taken from the label.

a. What would you do if a friend accidentally swallowed this pesticide?

b. By what routes of entry will this pesticide poison humans?

c. What is the antidote which a physician would use for this type of poisoning?

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing. Wear tightly woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance call 000 000 0000

TO PHYSICIAN: De Pesto is a reversible cholinesterase inhibitor. Do not use oximes such as 2 PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eye, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable! Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE ENTRY STATEMENT (IF APPLICABLE)

Do not enter within 48 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE - Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL - Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposed in approved landfill or buried in a safe place.

Consult Federal, State or local Disposal authorities for approved alternate procedures.

# RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

# DE PESTO

INSECTICIDE
EMULSIFIABLE CONCENTRATE

| | |
|---|---|
| ACTIVE INGREDIENT: pestoff—tri-salicylic acid | 45.0% |
| INERT INGREDIENTS: | 55.0% |
| TOTAL: | 100.0% |

THIS PRODUCT CONTAINS 4.0 LBS OF PESTOFF PER GALLON

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in a glass of warm water. Repeat until vomitus is clear. Call a physician immediately.

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and immediately wash skin with detergent and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
CHEMTON, NEVADA

EPA EST. NO. 1357-NV-1
EPA REGISTRATION NO. 1357-42

NET CONTENTS ONE GALLON

### DIRECTIONS FOR USE CONTINUED

METHODS OF APPLICATION: The minimum gallonage requirement is 10 gallons of finished spray per acre with ground equipment, 2 gallons per acre with aircraft.

ALFALFA: Air and Ground Application—Alfalfa Weevil Larvae, Egyptian Alfalfa Weevil Larvae, Pea Aphid, and in New York state for Snout Beetle control. Apply the amount of De Pesto indicated in the chart, when feeding is noticed or when insects appear. Alfalfa Weevil Adult—Apply 1/2 pints per acre when insects appear. Lygus Bugs—Apply 2 pints per acre prior to bloom. Observe the indicated number of days after application before cutting or grazing. Do not apply more than once per season. Apply only to field planted to pure stands of Alfalfa.

| Pints of De Pesto Per Acre | Do Not Cut or Graze Within |
|---|---|
| ½ | 7 days |
| 1 | 14 days |
| 2 | 28 days |

CORN FIELD: Ground Application—Corn Rootworms—Use 1½ pints of De Pesto per 13,000 linear feet (1 acre with 40 inch spacing). Apply, at planting, as a 7 inch band over the row or inject on each side of the row by mixing with water or liquid fertilizers. When De Pesto is used with liquid fertilizers, mix in the following way making sure that the mixture is physically compatible. Premix 1 part of De Pesto with 2 parts of water. Add this premix to the tank of fertilizer along with rinsings from the premixing container. Maintain agitation in the tank after mixing and during application. Do not mix until ready to use.

SUGARCANE: Sugarcane Borer—Apply 1-1½ pints De Pesto per acre using ground or aerial equipment. Check sugarcane fields weekly, beginning in early June and continuing through August. Make first application only after visible joints form and 5% or more of the plants are infested with young larvae feeding in or under the leaf sheath and which have not bored into the stalks. Repeat whenever field checks indicate the infestation exceeds 5%. Do not apply within 17 days of harvest. Do not use in Hawaii.

ORANGES, LEMONS, GRAPEFRUIT, and TANGELOS in Arizona and California: Air and Ground application—Citrus thrips—Apply De Pesto at ½ to 1 lb. per acre. Use sufficient water to obtain thorough coverage (5 to 15 gals/acre by air). Use the higher rate on severe infestations of thrips. Apply in the early spring before bloom when the new growth is about 3 to 4 inches long. Make additional applications as needed until the new fruit is walnut size. Application at petal fall may be critical to prevent fruit scarring. Applications during mid-summer to protect new growth on young trees are also recommended.

Do not apply within 3 days of harvest. Do not graze livestock in treated orchards for 10 days after treatment.

POTATO: Tuberworm, cabbage looper, aphids, and in areas east of the Mississippi River, leafhoppers and flea beetles. Apply De Pesto at indicated rates when field checks indicate the insect infestation is above 5%. Tuberworm, cabbage looper and aphid—apply ½ to 1 lb. per acre. Leafhopper and flea beetles—apply ½ lb per acre. Do not apply within 14 days of harvest.

## PERSONAL SAFETY AND FIRST AID
## UNIT VI

### ANSWERS TO TEST

1. a. 11
   b. 6
   c. 7
   d. 13
   e. 10
   f. 5
   g. 8
   h. 15
   i. 4
   j. 17
   k. 3
   l. 16
   m. 2
   n. 14
   o. 19
   p. 1
   q. 12
   r. 18
   s. 9

2. b

3. Discussion should include:
   a. Acute oral toxicity of pesticide
   b. Acute dermal toxicity of pesticide
   c. Acute inhalation toxicity of pesticide

4. a. 2
   b. 3
   c. 1
   d. 3

5. a. Organophosphates or organophosphorous--Example should be any one of the following:

   parathion, TEPP, Phosdrin, phorate (Thimet), demeton (Systox), Di-Syston, Guthion, phosphamidon, Monitor, malathion

   b. Carbamates--Example should be any one of the following:

   aldicarb (Temik), carbofuran (Furadan), carbaryl (Sevin), formetanate hydrochloride (Carzol), methomyl (Lannate)

   c. Chlorinated hydrocarbons or organochlorines--Example should be any one of the following:

   endrin, lindane, methoxychlor, endosulfan (Thiodan), dicofol (Kelthane)

6. a. Pesticides within a family cause the same kind of poisoning

   b. Pesticides within a family are sometimes similar in the hazards they cause

   c. First aid and antidote for poisoning are the same within a family

7. a. Oral

   b. Dermal

   c. Inhalation

8. a. Dermal and inhalation

   b. Oral and dermal

9. Discussion should include:

   a. Chemical cholinesterase is necessary for nervous system to function properly

   b. Carbamate and organophosphate pesticides attack cholinesterase in blood and make it useless

   c. A simple blood test is used to determine cholinesterase level and measure pesticide exposure

10. a. Careless practices

    b. Ignorance

11. a. 1

    b. 2, 3

    c. 2

    d. 3

    e. 1

    f. 2, 3

    g. 2

    h. 1

    i. 3

    j. 1

    k. 3

    l. 3

12. a, d, e, f, h

13. a. Poison on skin

    1) Act quickly

    2) Remove contaminated clothing and drench skin with water

    3) Cleanse skin and hair thoroughly with detergent and water

    4) Dry victim and wrap in blanket

b. Chemical burn

1) Wash with large quantities of running water

2) Remove contaminated clothing

3) Cover burned area immediately with loose, clean, soft cloth

c. Poison in eye

1) Wash eye quickly but gently

2) Hold eyelid open and wash with gentle stream of clean running water

3) Wash for 15 minutes or more

d. Inhaled poison

1) Carry victim to fresh air immediately

2) Get victim to a doctor

3) Open all doors and windows so no one else will be poisoned

4) Loosen tight clothing

5) Apply artificial respiration if breathing has stopped or is irregular

6) Keep victim as quiet as possible

7) Prevent chilling

14. b

15. a. No

b. Yes

c. No

d. Yes

16. Discussion should include:

a. Position victim face down or kneeling forward

b. Give victim large amounts of milk or water

c. Put finger or the blunt end of a spoon at the back of victim's throat or have victim drink a glass of very salty water

d. Collect some of the vomitus for doctor if you do not know what the poison is

17. a. Skin pale, moist, cold, and clammy

b. Eyes vacant with dilated pupils

c. Breathing shallow and irregular

d. Pulse weak, rapid, and irregular

18. a. Call doctor or take victim to the doctor or hospital

b. Check to see if patient is breathing

c. Locate pesticide label and have available for doctor

19. Evaluated to the satisfaction of the instructor

20. a. 3

b. 2

c. 6

d. 5

e. 9

f. 8

g. 7

h. 4

i. 1

21. Evaluated to the satisfaction of the instructor

22. a. Induce vomiting by giving a tablespoon of salt in a glass of warm water. Repeat until vomitus is clear. Call a physician immediately.

b. Oral and inhalation, probably dermal also (avoid contact with skin)

c. atropine

## SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

### TERMINAL OBJECTIVE

After completion of this unit, the student should be able to discuss safety steps for transporting pesticides. The student should be able to name safety rules before, during, and following pesticide application. The student should be able to discuss the types of clothing and equipment needed for pesticide applications and be able to interpret pesticide labels. This knowledge will be evidenced through demonstration and by scoring one-hundred percent on the unit test.

### SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with safety in pesticide application to the correct definitions.
2. Name factors to consider before applying pesticides.
3. Discuss in a short paragraph safety steps for transporting pesticides.
4. Name factors that determine types of protective clothing and protective equipment needed.
5. Name safety precautions used while mixing and handling concentrated pesticides.
6. Discuss in a short paragraph reasons for not applying pesticides on a windy day.
7. Name ways to prevent exposure during application.
8. Discuss in a short paragraph what is meant by sensitive areas.
9. Select from a list ways to avoid spills, drifts, and runoff.
10. Discuss in a short paragraph steps for equipment safety and maintenance.
11. Select from a list the ideal times of day to apply pesticides.
12. Name factors to consider following application.
13. Name safety rules to follow in cleaning up after application.
14. Discuss in short paragraphs the types of protective clothing and equipment needed for pesticide applications.
15. Match types of respirators to their uses.
16. Name safety rules for using the respirator correctly.
17. Interpret labels correctly by answering questions pertaining to safety.

# SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

## SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide student with objective sheet.
- B. Provide student with information and assignment sheets.
- C. Make transparencies.
- D. Discuss terminal and specific objectives.
- E. Discuss information and assignment sheets.
- F. Check local dealers to determine which ones sell proper protective clothing and equipment.
- G. Assemble the different types of respirators and demonstrate proper use, clean-up, and storage of each.
- H. Assemble the basic types of protective clothing and equipment. Give students a sample label, target pest, and application site and ask them to put on the necessary clothing and equipment for the job. Allow class to critique both over and under protection for the job.
- I. Assign several groups of students a pesticide job, including pest, crop or animal, pesticide, etc. Using the proper label, ask them to describe what to wear, how to mix, what day and time to apply, equipment safety, and clean up procedure.
- J. Give test.

II. Student:

- A. Read objective sheet.
- B. Study information sheet.
- C. Complete assignment sheets.
- D. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

    A. TM 1--Securing Containers

    B. TM 2--Proper Mixing

    C. TM 3--Proper Clothing For Mixing

    D. TM 4--Protective Clothing and Equipment

    E. TM 5--Types of Respirators

IV. Assignment sheets

    A. Assignment Sheet #1--Interpret De Metho Label

    B. Assignment Sheet #2--Interpret No-Disease Label

    C. Assignment Sheet #3--Interpret Anti-Weed Label

V. Answers to assignment sheets

VI. Test

VII. Answers to test

# SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

## INFORMATION SHEET

I. Terms and definitions

A. Application--Process of directing or placing pesticides on or in plants, animals, buildings, soil, air, water, or other site

B. Cartridge--Cylinder-shaped part of the respirator which absorbs fumes and vapors from the air

C. Cannister--Metal or plastic container filled with absorbent materials to filter fumes and vapors from the air

D. Dose, dosage--Portion or amount of pesticide mixture which is directed at the target

E. Downwind--Direction toward which the prevailing wind is blowing

F. Drift--Movement by wind and air currents of droplets or particles of a pesticide

G. Environment--Surroundings, usually water, air, soil, plants, and animals

H. Vaporize--To form a gas and disappear into the air

I. Exposure--Not protected or shielded; contact with pesticides through mouth, lungs, or skin

J. Face shield--Piece of protective equipment used by a pesticide applicator to protect face from exposure

K. Fume--Unpleasant or irritating smoke, vapor, or gas

L. Neoprene--A kind of synthetic rubber

M. Pollute--To make unclean or unsafe

N. Reentry interval--Period of time between a pesticide application and when persons may reenter an area without wearing protective clothing and equipment

O. Respirator--Face mask which filters out poisonous gases and particles

(NOTE: A respirator is used to protect the nose, mouth, and lungs from pesticide injury.)

P. Target--Pest to be treated with a pesticide

II. Factors to consider before applying pesticides

  A. Transportation

    (CAUTION: Use safest way of getting the pesticide to the place of application.)

  B. Climatic conditions

    (NOTE: Check for possible wind or rain before applying and listen to the weather forecast.)

  C. Protective clothing and equipment

    (NOTE: Use what is needed for the job. Remember that safety comes first.)

  D. Mixing and filling

    (CAUTION: Protect yourself and the environment.)

  E. Reading label

    (NOTE: This is a must. Always read the label for correct dosages, hazards, precautions, and the types of protective clothing and equipment that will be needed for the job.)

  F. Equipment

    (NOTE: Ask yourself if you have the correct equipment for the job and if the equipment is in proper working condition.)

III. Safety steps for transporting pesticides (Transparency 1)

  A. Never carry pesticides inside car or truck cab

  B. Secure containers to keep from shifting, rolling, or bouncing

  C. Never transport livestock feed, seeds, or groceries in the same load with pesticides

  D. Never allow children to ride on or near pesticides

    (CAUTION: Carelessness in moving pesticide poisons can result in broken containers, spills, contamination, and injury to people and animals.)

## INFORMATION SHEET

IV. Factors that determine types of protective clothing and protective equipment needed

A. Always wear at least closely woven fabric coveralls (or long sleeved shirt and long legged trousers), socks and waterproof shoes (or boots), a hat, and gloves.

B. READ THE LABEL!

(NOTE: The label will state the additional protective clothing and equipment necessary for the pesticide being used.)

C. Toxicity of pesticide

(NOTE: Check the signal words on the label.)

D. Formulation

(NOTE: Some formulations are more hazardous to the applicator than others.)

E. Application equipment

(NOTE: If you will be drenched with spray or inhaling dust, spray or fumes take more precautions.)

F. Degree of exposure

(NOTE: Take more precautions if you will be working with pesticides for a long period of time.)

V. Safety precautions used while mixing and handling concentrated pesticides (Transparencies 2 and 3)

A. Use neoprene or natural rubber gloves and boots, closely woven fabric coveralls, rubber apron, goggles, hat, and a respirator if needed

(NOTE: When mixing concentrated highly toxic pesticides all protective clothing and equipment must be worn, including a respirator.)

B. Mix only what will be used

C. Mix according to the label

D. Do not combine pesticides

(NOTE: Combining pesticides is sometimes approved. However, the label or a local expert must verify this.)

E. Avoid splashes, spills, and drift when opening containers

F. Change clothes immediately in case of a splash or spill

G. Stand with head above fill hole of spray tank

(NOTE: Splashing pesticides in your face and eyes can be extremely dangerous. You must keep your head and face well above the fill hole. Do not stand downwind when pouring or mixing.)

VI. Reasons for not applying pesticides on a windy day

A. Drift and vaporization

B. Injury to wildlife, plants, pollinators, and domestic animals

C. Contamination of surface water, such as ponds, streams, rivers, and lakes

D. Increase in inhalation and contact hazard to the applicator

(NOTE: The applicator is legally responsible for any injury or money loss on crops due to pesticide drift onto nontarget areas. Don't take a chance by spraying when it is windy.)

VII. Ways to prevent exposure during application

A. Wear protective clothing and equipment

B. Do not wipe hands on clothing

(NOTE: Carry a special towel for wiping hands.)

(CAUTION: Do not wipe gloves on your clothing, especially if chemicals are on the gloves. Your clothing can become contaminated and the chemicals may soak through to your skin.)

C. Never blow out clogged hoses, nozzles, or lines with your mouth

D. Never eat, drink, or smoke when handling pesticides

E. Work in pairs when handling hazardous pesticides or at least let someone know where you will be working

F. Keep persons, livestock, and pets out of spray area

(NOTE: When working with pesticides day after day, even moderately toxic chemicals can poison you. Wear protective equipment, especially a respirator.)

(CAUTION: Do not let children or pets play around sprayers, dusters, filler tanks, storage areas, or old pesticide containers. Use the proper rates. Overdose won't kill pests twice but may injure humans, crops, or wildlife.)

VIII. Sensitive areas--Areas or locations of parks, playgrounds, bird and wildlife sanctuaries, ponds, streams, water supplies, barnyards, feedlots, pastures, bee yards, schools, homes, hospitals, and any other areas where out-of-place pesticides might cause harm

IX. Ways to avoid spills, drift, and runoff

- A. Do not apply during high winds
- B. Check equipment for leaks and proper delivery rate
- C. Use proper formulation for the job
- D. Do not apply if rain is approaching unless the pesticide calls for it, like some protectant fungicides and some herbicides

X. Steps for equipment maintenance and safety

- A. Check for leaks in pump and tank
- B. Check for leaky hose connections and carefully dispose of worn or cracked hoses
- C. Keep spray tank lid tight
- D. Stay with tank during filling
- E. Shut down machinery while making repairs or adjustments
- F. Do not blow out clogged lines with your mouth

(NOTE: Your application equipment can help you use pesticides safely. However, poor maintenance and careless use can add to the hazard.)

XI. Times of day to apply pesticides

- A. Early morning
- B. Evening

(NOTE: Wind speed is usually lowest at these times of day, and drift hazard is greatly reduced. Avoiding full daylight hours may lower the contact danger to birds, mammals, and pollinators.)

- C. Anytime on a day which is calm or still and when crops or weeds are not in full bloom

XII. What to do following application

A. Dispose of empty containers

B. Store leftover pesticides

C. Clean up equipment

D. Determine reentry interval

(NOTE: Reentry time on the label must be checked and workers and other persons must be warned.)

XIII. Cleaning up after application

A. Always take a shower or bath when you finish using pesticides

B. Change spray clothing daily and separate spray clothing from family laundry

C. Launder the spray clothing separately from all other clothing

D. Do not wash clothing in streams or ponds

(NOTE: The pesticides on your spray clothes could harm other people who touch them. Warn the person who will be washing your spray clothes of possible danger.)

XIV. Protective clothing and equipment needed for pesticide applications (Transparency 4)

(NOTE: Use protective clothing and equipment called for on the label.)

A. Gloves

1. Obtain unlined, elbow length neoprene or natural rubber gloves

(NOTE: Some chemicals will dissolve rubber or make it sticky.)

2. Make sure sleeves are outside your gloves

(NOTE: This should be done unless spraying overhead.)

3. Discard the gloves if any holes appear

4. Wash gloves with detergent and water before removing

(CAUTION: Never use cotton or leather gloves unless specified on the label. These can be more hazardous than no protection at all because they hold the pesticide close to your skin.)

## INFORMATION SHEET

B. Coveralls

1. Wear clean tightly woven fabric coveralls that cover entire body or long sleeved shirt and long legged trousers

   (NOTE: Most applicators who apply pesticides regularly have special coveralls kept just for pesticide applications.)

2. Wear waterproof suit or apron when mixing highly toxic pesticides

3. Wear waterproof suit when you may be drenched during application

4. Wash clothes with detergent and water

C. Boots

1. Wear lightweight, unlined neoprene or natural rubber boots

   (NOTE: Boots should cover your ankles.)

2. Put pant legs outside of boots

   (NOTE: This will keep pesticide from draining into the boot.)

3. Wash and dry boots inside and out after each use

D. Goggles and face shield

1. Wear tight-fitting goggles or a face shield when pesticide spray or dust could get on your face or in your eyes

2. Wear goggles or face shield when pouring and mixing

3. Wash goggles or face shield after each use

4. Wear plastic or rubber headband if possible

E. Head and neck covering

1. Protect hair and skin on neck from pesticide spray or dust

2. Wear waterproof wide-brimmed hats or hard hats

   (NOTE: In cool weather a hooded waterproof parka and a bill cap are also good.)

## INFORMATION SHEET

XV. Types of respirators and their uses (Transparency 5)

  A. Cartridge respirator

  (NOTE: This is a half-face mask which covers the nose and mouth only.)

    1. Use when exposed to concentrated chemicals for short periods

    2. Use when exposed to low concentration of toxic chemicals for long periods of time

    (NOTE: The main limitation of this type of respirator is the short life of the absorbing material in the cartridge.)

  B. Gas mask or cannister respirator--Used when exposed to toxic fumes in heavy concentrations for long periods of time

  (NOTE: This is a respirator which covers the entire face and protects your eyes as well as your nose and mouth. It has more absorbent material than cartridge respirators.)

  C. Air-supplied respirators and self contained air-supplied respirators

  (NOTE: These are respirators which cover the entire face. A separate air supply is used, not the air with pesticide vapors in it.)

    1. Use when oxygen supply in air is low

    2. Use when exposed to high concentrations of highly toxic pesticides in enclosed areas, such as fumigation

XVI. Safety rules for using respirator correctly

  A. Make sure it fits properly on your face

  (NOTE: It should be worn tightly enough to form a seal all around your face. Full beards often do not allow a seal to form properly and, therefore, are dangerous on pesticide applicators.)

  B. Check filter often

  (NOTE: Cartridges and cannisters should be changed at least after every eight hours of use. If you notice a pesticide odor, first check to be sure the respirator is fitted properly on your face. If the odor remains, change the cartridge or cannister immediately.)

  C. Wash face piece with detergent and warm water

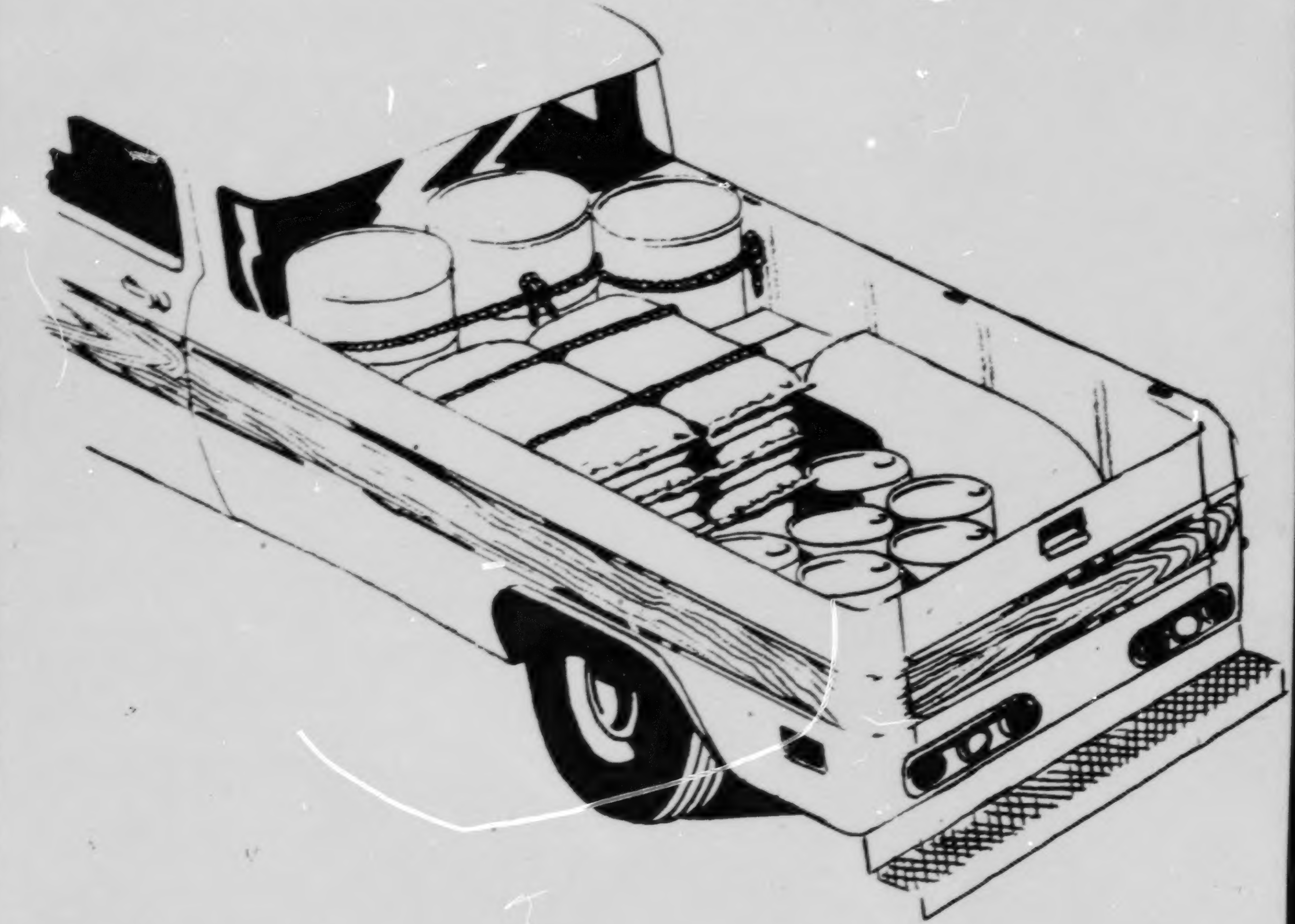
D. Rinse thoroughly and dry

(NOTE: Store the respirator, filters, cannisters, and cartridges in a clean, dry place away from pesticides. A tightly closed plastic bag works well for storage.)

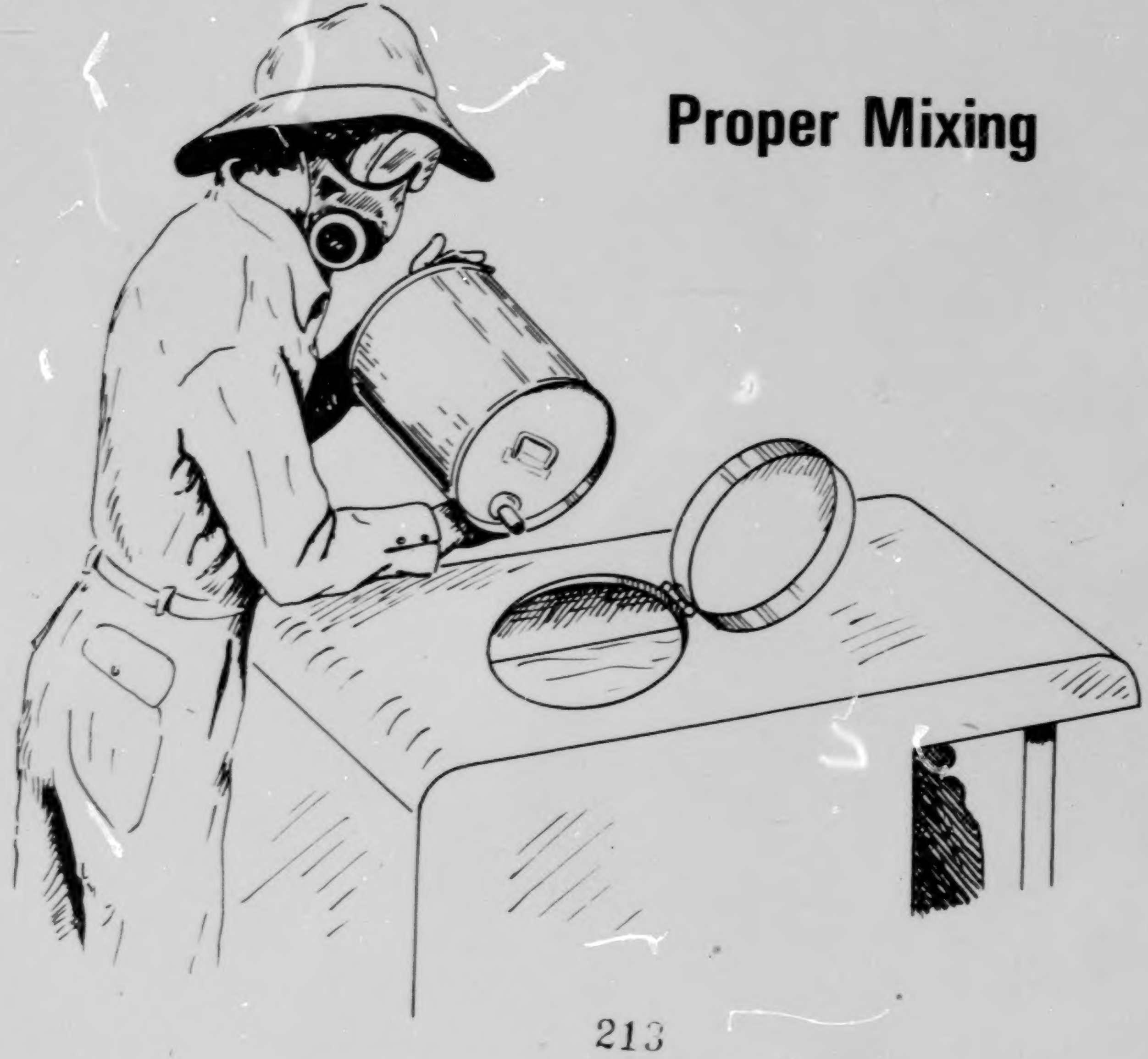
E. Use only those respirators approved by the National Institute for Occupational Safety and Health (NIOSH) or the Mining Enforcement and Safety Administration (MESA), both formerly U.S. Bureau of Mines

(NOTE: The approved respirators will bear a stamp with either NIOSH or MESA imprinted on them.)

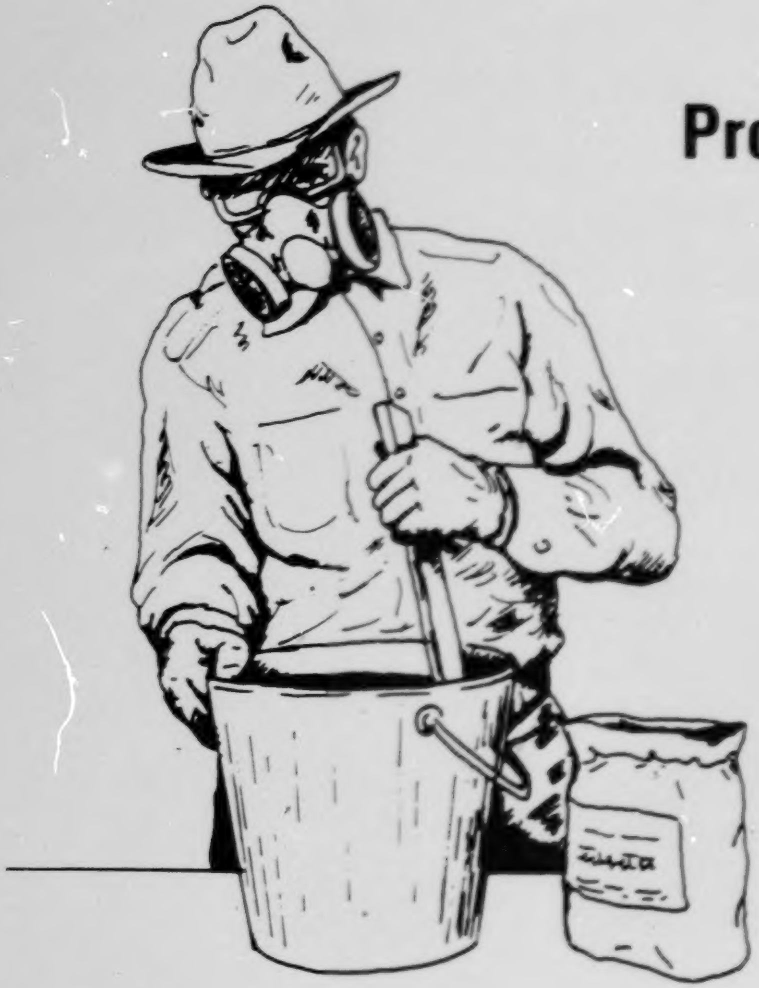
# Securing Containers



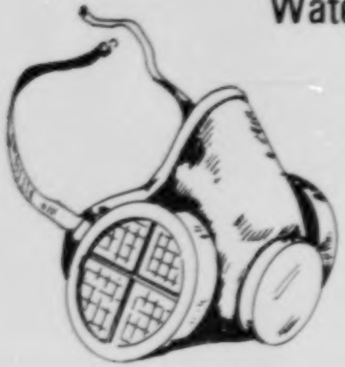
## Proper Mixing



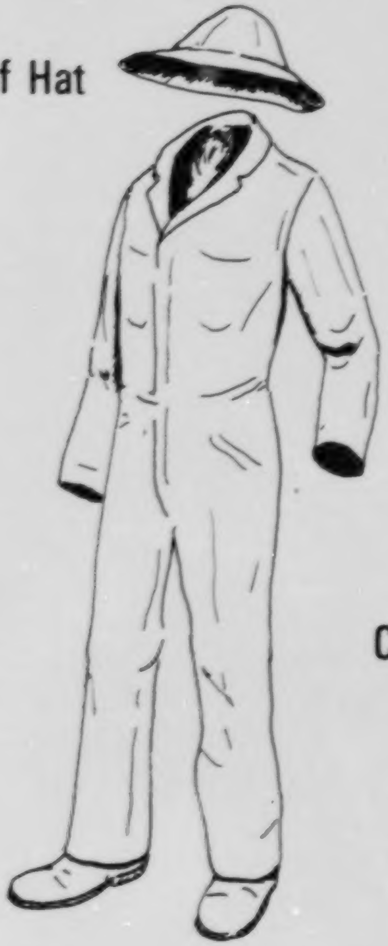
# Proper Clothing for Mixing



# Protective Clothing and Equipment



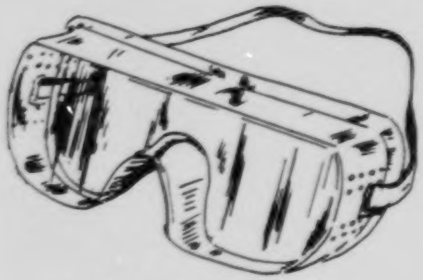
Respirator



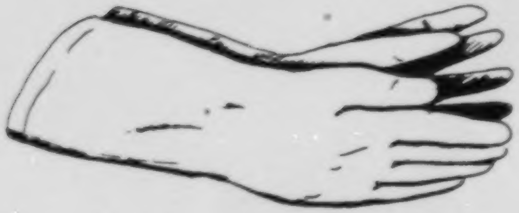
Waterproof Hat

Closely Woven Fabric Coveralls

Rubber or Neoprene Boots



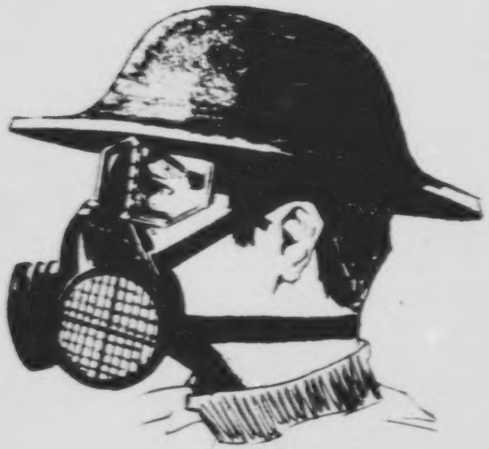
Goggles



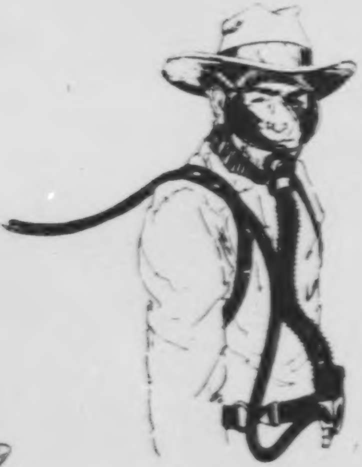
Long Rubber or
Neoprene Gloves

# Types of Respirators

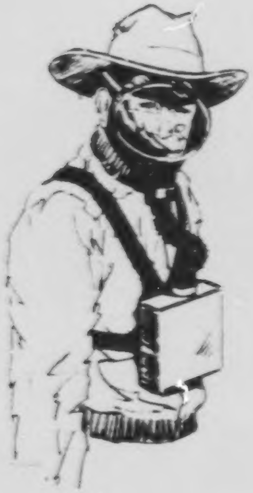
257



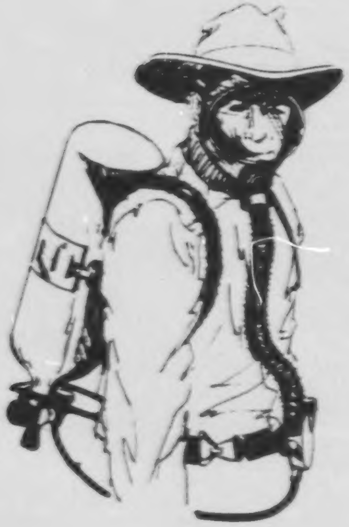
Cartridge



Supplied Air



Cannister



Self-contained

TM 5

## SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

### ASSIGNMENT SHEET #1--INTERPRET DE METHO LABEL

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read the label on the following page and answer the questions below. When completed, return assignment sheet to instructor for evaluation.

1. What signal word is on the label?

2. What toxicity category does it represent?

3. What protective clothing would you wear?

4. What protective equipment would you use?

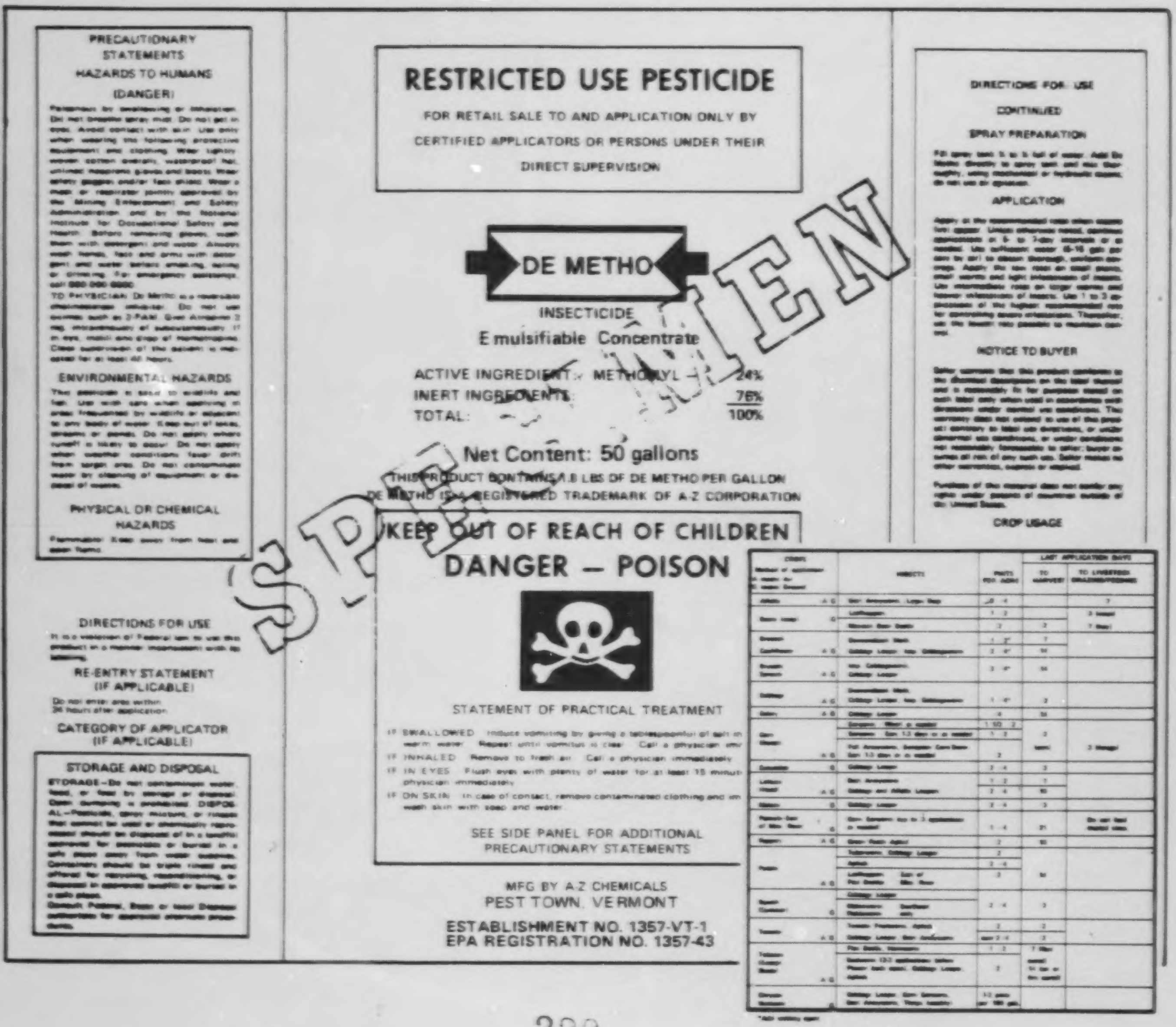
5. Who approved respirators for use with De Metho?

6. Should you tuck the trousers into the boots?

7. Should you tuck the sleeves into the gloves?

8. Is drift a problem with this pesticide?

9. What would you wear while mixing De Metho?



## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

# DE METHO

INSECTICIDE

Emulsifiable Concentrate

| | | |
|---|---|---|
| ACTIVE INGREDIENT: | METHOMYL | 24% |
| INERT INGREDIENTS: | | 76% |
| TOTAL: | | 100% |

**Net Content: 50 gallons**

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician imm

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minut physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and im wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

**ESTABLISHMENT NO. 1357-VT-1**
**EPA REGISTRATION NO. 1357-43**

### PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS (DANGER)

### ENVIRONMENTAL HAZARDS

### PHYSICAL OR CHEMICAL HAZARDS

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within 24 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

### DIRECTIONS FOR USE CONTINUED

### SPRAY PREPARATION

### APPLICATION

### NOTICE TO BUYER

### CROP USAGE

SPECIMEN

ASSIGNMENT SHEET #1

## ASSIGNMENT SHEET #2--INTERPRET NO-DISEASE LABEL

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read the label on the following page and answer the questions below. When completed, return assignment sheet to instructor for evaluation.

1. What signal word appears on the label?

2. What toxicity category does the signal word represent?

3. What protective clothing would you wear?

4. What protective equipment would you wear?

5. Would you need to take a shower or bath after you finish the job?

6. Since this has a caution label, would it be okay to smoke or eat a candy bar during application?

7. What would you wear while mixing the No-Disease?

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with

**ALMONDS: Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half-to-full bloom.

**APPLES, PEARS:** Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP): White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH: Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII): Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES: Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS: Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 35 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL.

# NO-DISEASE

**BENOMYL FUNGICIDE**

**Wettable Powder**

| | |
|---|---|
| **ACTIVE INGREDIENT** | |
| Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate] | 50% |
| **INERT INGREDIENTS** | 50% |

U.S. Pats. 3,541,213 & 3,631,176 EPA Est. 1352-WV-1 EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.
Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing. Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

**NET 50 LBS.**

B-21150 8-73A Made in U.S.A. Printed in U.S.A.

**KILL-DEAD CHEMICALS**
Chemical City, West Virginia

**PECANS: Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may be added to the spray to improve wetting of foliage. Apply at prepollination when young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE: Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. per 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thorough wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom; apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 weeks after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by Rhizopus spp. and Alternaria spp.

**STRAWBERRIES: Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Leaf Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue at 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acre when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals as needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII): Pineapple Disease (Ceratocystis paradoxa)**—Apply to cut seedpieces either as a cold dip or hot dip.

*Cold Dip*—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to give thorough wetting; remove and allow to drain.

*Hot Dip*—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of the dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES (Powdery Mildew, Black Spot); FLOWERS, ORNAMENTALS (Powdery Mildew, Botrytis Gray Mold):** Field and Greenhouse—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, use 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-day intervals throughout the growing season; shorten interval during humid, rainy weather. Addition of a surfactant to the spray mixture enhances curative action of the fungicide, and improves distribution of the spray on hard-to-wet plants such as roses.

**BULBS (Easter Lily, Tulip, Gladiolus, Daffodil, Iris); Fusarium and Penicillium Rots**—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak cleaned bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hours after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bulbs have been heat-cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

# SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

## ASSIGNMENT SHEET #3--INTERPRET ANTI-WEED LABEL

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read the label on the following page and answer the questions below. When completed, return assignment sheet to instructor for evaluation.

1. What signal word is on the label?

2. What toxicity category does it represent?

3. What protective clothing would you wear?

4. What protective equipment would you wear?

5. Should you launder your clothing following application?

223

ASSIGNMENT SHEET #3

# Anti-Weed

# 20G

## SAMPLE LABEL

## Herbicide

FOR WEED CONTROL
IN CORN

Active Ingredients:
Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . 20.0%
Inert Ingredients: 80.0%
Total: 100.0%

Anti-Weed 20G is a granular herbicide

**Warning:**

Keep out of reach of children. See additional warning statements on back of bag.

**50**
**Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

**KILL-DEAD**
**Chemical Company**
Chemical City, West Virginia

# ASSIGNMENT SHEET #3

## DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

**IMPORTANT**: Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

### Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of **Kill-Dead** or the Seller. All such risks shall be assumed by the Buyer.

**Kill-Dead** warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks referred to above. **Kill-Dead makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty.** In no case shall **Kill-Dead** or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. **Kill-Dead** and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of **Kill-Dead Chemical Company**.

### General Information

Anti-Weed will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since Anti-Weed acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

Anti-Weed is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using Anti-Weed where adjacent desirable trees, shrubs or plants might be injured.

Store Anti-Weed in a dry place.

**Application Instructions**

Broadcast or Overall Treatment

Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment

Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \frac{\text{Recommended}}{\text{Broadcast Rate}} = \begin{array}{c}\text{lbs./Acre}\\ \text{Anti-Weed}\\ \text{for Band}\\ \text{Treatment}\end{array}$$

**Range of Rates**: In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

### Directions for Use

**Anti-Weed controls most annual broadleaf and grass weeds such as:**

**Giant Foxtail**
**Green Foxtail**
**Yellow Foxtail**
**Barnyardgrass**
**(Watergrass)**
**Crabgrass**

**Fall Panicum**
**Annual Morningglory**
**Cocklebur**
**Sandbur**
**Jimsonweed**
**Lambsquarters**

**Mustard**
**Pigweed**
**Ragweed**
**Smartweed**
**Sunflower**
**Velvetleaf**

Anti-Weed will not control perennial weeds such as:

Johnsongrass Field Bindweed Canada Thistle Bull Nettle

Apply Anti-Weed at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| **Soil** | **Rate per acre of** Anti-Weed **Broadcast** |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs. |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–<br>30 lbs. |

*For calculation of band treatment rate, see Application Instructions Section.

** Anti-Weed should not be used on high organic soils such as peat and muck.

**Suggestions for Crop Rotations**

1) Corn may be replanted at any time following application of Anti-Weed. 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions:** 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following Anti-Weed application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

### Warning

Keep out of reach of children.

Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.

This product is toxic to fish. Keep out of lakes, ponds and streams.

Do not reuse container. Destroy when empty.

# SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

## ANSWERS TO ASSIGNMENT SHEETS

### Assignment Sheet #1

1. Danger (Poison, Skull and Crossbones)
2. Highly toxic
3. Closely woven fabric coveralls
4. Neoprene gloves and boots, waterproof hat with brim, goggles or face shield, and approved respirator
5. National Institute for Occupational Safety and Health (NIOSH) or the Mining Enforcement and Safety Administration (MESA), both formerly U.S. Bureau of Mines
6. No
7. No
8. Yes--Do not apply when weather conditions favor drift from areas treated
9. Rubber apron, closely woven fabric coveralls, neoprene gloves and boots, waterproof hat with brim, goggles or face shield, approved respirator

### Assignment Sheet #2

1. Caution
2. Slightly toxic to relatively nontoxic
3. Closely woven fabric coveralls (or work clothing), socks, and waterproof shoes
4. Wide-brimmed hat and gloves (optional goggles and boots)
5. Yes--Always take shower or bath after applying any pesticide
6. No, never!
7. Rubber apron over the coveralls, socks, waterproof shoes, wide-brimmed hat, gloves, goggles; cannister respirator is optional to avoid breathing the powder or dust

Assignment Sheet #3

1. Warning
2. Moderately toxic
3. Closely woven fabric coveralls or work clothing, socks, and waterproof shoes
4. Neoprene or rubber gloves, hat, optional boots, goggles or face shield
5. Launder clothing before reuse

# SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

## TEST

1. Match the terms on the right to the correct definitions on the left by placing the appropriate numbers in the blanks provided.

_____a. Process of directing or placing pesticides on or in plants, animals, buildings, soil, air, water, or other site

_____b. Metal or plastic container filled with absorbent materials to filter fumes and vapors from the air

_____c. Cylinder-shaped part of the respirator which absorbs fumes and vapors from the air

_____d. Portion or amount of pesticide mixture which is directed at the target

_____e. Pest to be treated with a pesticide

_____f. Direction toward which the prevailing wind is blowing

_____g. Face mask which filters out poisonous gases and particles

_____h. Movement by wind and air currents of droplets or particles of a pesticide

_____i. Period of time between a pesticide application and when persons may reenter an area without wearing protective clothing and equipment

_____j. To make unclean or unsafe

_____k. Surroundings, usually water, air, soil, plants, and animals

_____l. A kind of synthetic rubber

_____m. To form a gas and disappear into the air

_____n. Not protected or shielded; contact with pesticides through mouth, lungs, or skin

_____o. Piece of protective equipment used by pesticide applicator to protect face from exposure

_____p. Unpleasant or irritating smoke, vapor, or gas

1. Target
2. Respirator
3. Reentry interval
4. Pollute
5. Cannister
6. Fume
7. Face shield
8. Vaporize
9. Environment
10. Drift
11. Downwind
12. Dose, dosage
13. Cartridge
14. Application
15. Neoprene
16. Exposure

2. Name four factors to consider before applying pesticides.

   a.

   b.

   c.

   d.

3. Discuss in a short paragraph safety steps for transporting pesticides.

4. Name factors that determine types of protective clothing and protective equipment needed.

   a.

   b.

   c.

   d.

   e.

   f.

5. Name three safety precautions used while mixing and handling concentrated pesticides.

   a.

   b.

   c.

6. Discuss in a short paragraph reasons for not applying pesticides on a windy day.

7. Name three ways to prevent exposure during application.

   a.

   b.

   c.

8. Discuss in a short paragraph what is meant by sensitive areas.

9. Select from the list below ways to avoid spills, drifts, and runoff. Place an "X" in the proper blanks.

_____a. Apply when time is available

_____b. Use proper formulation for the job

_____c. Apply after a rain when there is standing water

_____d. Check equipment for leaks and proper delivery rate

_____e. Do not apply during high winds

_____f. Do not apply if rain is approaching unless the pesticide calls for it, like some protectant fungicides and some herbicides

10. Discuss in a short paragraph steps for equipment maintenance and safety.

11. Select from the list below the ideal times of day to apply pesticides. Place an "X" in the correct blanks.

_____a. At noon when temperature is adequate

_____b. Evening

_____c. Early morning

_____d. Afternoon when the humidity is high

12. Name factors to consider following application.

a.

b.

c.

d.

13. Name safety rules to follow in cleaning up after application.

a.

b.

c.

d.

14. Discuss in short paragraphs the types of protective clothing and equipment needed for pesticide applications.

a. Gloves

b. Coveralls

c. Boots

d. Goggles and face shield

e. Head and neck covering

15. Match the types of respirators on the right to the proper uses on the left. Place the appropriate numbers in the blanks. Each number may be used more than once.

______a. Use when exposed to concentrated chemicals for short periods

______b. Use when exposed to high concentrations of highly toxic pesticides in enclosed areas, such as fumigation

______c. Use when exposed to low concentration of toxic chemicals for long periods of time

______d. Use when oxygen supply in air is low

______e. Use when exposed to toxic fumes in heavy concentrations for long periods of time

1. Air-supplied respirators and self-contained air-supplied respirators

2. Gas mask or cannister respirator

3. Cartridge respirator

16. Name four safety rules for using the respirator correctly.

a.

b.

c.

d.

17. Interpret the following label by answering the questions below.

a. What signal word is on this label?

b. What toxicity category does it represent?

c. What protective clothing would you wear?

d. What protective equipment would you use?

e. After you have been applying this pesticide for awhile and you decide you want a drink, what must you do first?

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

(DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing: Wear tightly woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance call 000-000-0000.

TO PHYSICIAN: De Pesto is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eyes, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable! Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter within 48 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposal in approved landfill or buried in a safe place.

Consult Federal, State or local Disposal authorities for approved alternate procedures.

# RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

# DE PESTO

INSECTICIDE
EMULSIFIABLE CONCENTRATE

| | |
|---|---|
| ACTIVE INGREDIENT: pestoff—tri-salicylic acid | 45.0% |
| INERT INGREDIENTS: | 55.0% |
| TOTAL: | 100.0% |

THIS PRODUCT CONTAINS 4.0 LBS OF PESTOFF PER GALLON

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in a glass of warm water. Repeat until vomitus is clear. Call a physician immediately.

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and immediately wash skin with detergent and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
CHEMTON, NEVADA

EPA EST. NO. 1357-NV-1
EPA REGISTRATION NO. 1357-42

NET CONTENTS ONE GALLON

## DIRECTIONS FOR USE CONTINUED

METHODS OF APPLICATION: The minimum gallonage requirement is 10 gallons of finished spray per acre with ground equipment; 2 gallons per acre with aircraft.

ALFALFA: Air and Ground Application—Alfalfa Weevil Larvae, Egyptian Alfalfa Weevil Larvae, Pea Aphid, and in New York state for Snout Beetle control. Apply the amount of De Pesto indicated in the chart, when feeding is noticed or when insects appear. Alfalfa Weevil Adult—Apply 1-2 pints per acre when insects appear. Lygus Bugs—Apply 2 pints per acre prior to bloom. Observe the indicated number of days after application before cutting or grazing. Do not apply more than once per season. Apply only to field planted to pure stands of Alfalfa.

| Pints of De Pesto Per Acre | Do Not Cut or Graze Within |
|---|---|
| ½ | 7 days |
| 1 | 14 days |
| 2 | 28 days |

CORN FIELD: Ground Application—Corn Rootworms—Use 1½ pints of De Pesto per 13,000 linear feet (1 acre with 40 inch spacing). Apply, at planting, as a 7 inch band over the row or inject on each side of the row by mixing with water or liquid fertilizers. When De Pesto is used with liquid fertilizers, mix in the following way making sure that the mixture is physically compatible. Premix 1 part of De Pesto with 2 parts of water. Add this premix to the tank of fertilizer along with rinsings from the premixing container. Maintain agitation in the tank after mixing and during application. Do not mix until ready to use.

SUGARCANE: Sugarcane Borer—Apply 1-1½ pints De Pesto per acre using ground or aerial equipment. Check sugarcane fields weekly, beginning in early June and continuing through August. Make first application only after visible joints form and 5% or more of the plants are infested with young larvae feeding in or under the leaf sheath and which have not bored into the stalks. Repeat whenever field checks indicate the infestation exceeds 5%. Do not apply within 17 days of harvest. Do not use in Hawaii.

ORANGES, LEMONS, GRAPEFRUIT, and TANGELOS in Arizona and California: Air and Ground application—Citrus thrips—Apply De Pesto at ½ to 1 lb. per acre. Use sufficient water to obtain thorough coverage (5 to 10 gallons/acre by air). Use the higher rate on severe infestations of thrips. Apply in the early spring before bloom when the new growth is about 3 to 4 inches long. Make additional applications as needed until the new fruit is walnut size. Application at petal fall may be critical to prevent fruit scarring. Applications during mid-summer to protect new growth on young trees are also recommended.

Do not apply within 3 days of harvest. Do not graze livestock in treated orchards for 10 days after treatment.

POTATO: Tuberworm, cabbage looper, aphids, and in areas east of the Mississippi River, leafhoppers and flea beetles. Apply De Pesto at indicated rates when field checks indicate the insect infestation is above 5%. Tuberworm, cabbage looper and aphids—apply ½ to 1 lb. per acre. Leafhopper and flea beetles—apply ½ lb. per acre. Do not apply within 14 days of harvest.

## SAFETY BEFORE, DURING, AND FOLLOWING APPLICATION
## UNIT VII

### ANSWERS TO TEST

1. a. 14
   b. 5
   c. 13
   d. 12
   e. 1
   f. 11
   g. 2
   h. 10
   i. 3
   j. 4
   k. 9
   l. 15
   m. 8
   n. 16
   o. 7
   p. 6

2. Any four of the following:
   a. Transportation
   b. Climatic conditions
   c. Protective clothing and equipment
   d. Mixing and filling
   e. Reading label
   f. Equipment

3. Discussion should include:
   a. Never carry pesticides inside car or truck cab
   b. Secure containers to keep from shifting, rolling, or bouncing
   c. Never transport livestock feed, seed, or groceries in the same load with pesticides
   d. Never allow children to ride on or near pesticides

4. a. Always wear at least closely woven fabric coveralls (or long sleeved shirt and long legged trousers), socks and waterproof shoes (or boots), a hat, and gloves
   b. READ THE LABEL!
   c. Toxicity of pesticide
   d. Formulation
   e. Application equipment
   f. Degree of exposure

5. Any three of the following:

   a. Use neoprene or natural rubber gloves and boots, closely woven fabric coveralls, goggles, rubber apron, hat, and a respirator if needed

   b. Mix only what will be used

   c. Mix according to the label

   d. Do not combine pesticides

   e. Avoid splashes, spills, and drift when opening containers

   f. Change clothes immediately in case of a splash or spill

   g. Stand with head above fill hole of spray tank

6. Discussion should include:

   a. Drift and vaporization

   b. Injury to wildlife, plants, pollinators, and domestic animals

   c. Contamination of surface water, such as ponds, streams, rivers, and lakes

   d. Increase in inhalation contact hazard to the applicator

7. Any three of the following:

   a. Wear protective clothing and equipment

   b. Do not wipe hands on clothing

   c. Never blow out clogged hoses, nozzles, or lines with your mouth

   d. Never eat, drink, or smoke when handling pesticides

   e. Work in pairs when handling hazardous pesticides or at least let someone know where you will be working

   f. Keep persons, livestock, and pets out of spray area

8. Discussion should include:

   Areas or locations of parks, playgrounds, bird and wildlife sanctuaries, ponds, streams, water supplies, barnyards, feedlots, pastures, bee yards, schools, homes, hospitals, and any other areas where out-of-place pesticides might cause harm

9. b, d, e, f

10. Discussion should include:

    a. Check for leaks in pump and tank

    b. Check for leaky hose connections and carefully dispose of worn or cracked hoses

c. Keep spray tank lid tight

d. Stay with tank during filling

e. Shut down machinery while making repairs or adjustments

f. Do not blow out clogged lines with your mouth

11. b, c

12. a. Dispose of empty containers

    b. Store leftover pesticides

    c. Clean up equipment

    d. Determine reentry interval

13. a. Always take a shower or bath when you finish using pesticides

    b. Change spray clothing daily and separate spray clothing from family laundry

    c. Launder spray clothing separately from all other clothing

    d. Do not wash clothing in streams or ponds

14. Discussion should include:

    a. Gloves

        1) Obtain unlined, elbow length neoprene or natural rubber gloves

        2) Make sure sleeves are outside your gloves

        3) Discard the gloves if any holes appear

        4) Wash gloves with detergent and water before removing

    b. Coveralls

        1) Wear clean tightly woven fabric coveralls that cover entire body or long sleeved shirt and long legged trousers

        2) Wear waterproof suit or apron when mixing highly toxic pesticides

        3) Wear waterproof suit when you may be drenched during application

        4) Wash clothes with detergent and water

    c. Boots

        1) Wear lightweight, unlined neoprene or natural rubber boots

        2) Put pant legs outside of boots

        3) Wash and dry boots inside and out after each use

d. Goggles and face shield

   1) Wear tight-fitting goggles or a face shield when pesticide spray or dust could get on your face or in your eyes

   2) Wear goggles or face shield when pouring and mixing

   3) Wash goggles or face shield after each use

   4) Wear plastic or rubber headband if possible

e. Head and neck covering

   1) Protect hair and skin on neck from pesticide spray or dust

   2) Wear waterproof wide-brimmed hats or hard hats

15. a. 3

    b. 1

    c. 3

    d. 1

    e. 2

16. Any four of the following:

    a. Make sure it fits properly on your face

    b. Check filter often

    c. Wash face piece with detergent and warm water

    d. Rinse thoroughly and dry

    e. Use only those respirators approved by the National Institute for Occupational Safety and Health (NIOSH) or the Mining Enforcement and Safety Administration (MESA), both formerly U.S. Bureau of Mines

17. a. Danger (Poison, Skull and Crossbones)

    b. Highly toxic

    c. Closely woven fabric coveralls

    d. Neoprene (or natural rubber) gloves and boots, waterproof hat with brim, goggles or face shield, and an approved respirator

    e. Wash hands, face, and arms first

# FORMULATION AND APPLICATION
## UNIT VIII

## TERMINAL OBJECTIVE

After completion of this unit, the student should be able to calculate problems determining amounts of wettable powder and emulsifiable concentrate to use. The student should be able to discuss advantages, disadvantages, and principal uses of various types of formulations and interpret labels as to type of formulation and mixing procedure when given the labels. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

## SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with formulation and application of pesticides to the correct definitions.
2. Match types of pesticide formulations to the correct descriptions.
3. List factors an applicator must consider when selecting a formulation.
4. Match methods of pesticide application to the correct descriptions.
5. Discuss advantages, disadvantages, and principal uses of various types of formulations.
6. Select from a list the best time to mix pesticides.
7. List in the proper sequence the procedure for mixing wettable powders.
8. List in the proper sequence the procedure for mixing emulsifiable concentrates.
9. List safety precautions to observe when mixing and handling pesticides.
10. Describe the importance of drift control.
11. List factors to consider in determining the application rate.
12. Calculate problems determining amounts of wettable powder to use.
13. Calculate problems determining amounts of emulsifiable concentrate to use.
14. Complete a chart of liquid and volume measures.
15. Interpret labels as to type of formulation and mixing procedure when given the labels.

# FORMULATION AND APPLICATION
## UNIT VIII

### SUGGESTED ACTIVITIES

I. Instructor:

   A. Provide student with objective sheet.

   B. Provide student with information and assignment sheets.

   C. Make transparencies.

   D. Discuss terminal and specific objectives.

   E. Discuss information and assignment sheets.

   F. Provide student with opportunity to practice mixing pesticides by using flour for wettable powder and oil for an emulsifiable concentrate. Use water to dilute them. DO NOT USE ACTUAL PESTICIDES.

   G. Have student survey farms or dealers to determine which formulations are most often used in the area. Discuss why.

   H. Give test.

II. Student:

   A. Read objective sheet.

   B. Read and study information sheet.

   C. Complete assignment sheets.

   D. Take test.

### INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

   A. TM 1--Types of Formulations

   B. TM 2--Methods of Application

   C. TM 3--Methods of Application (Continued)

IV. Assignment sheets

  A. Assignment Sheet #1--Calculate Spray Materials Using Wettable Powder

  B. Assignment Sheet #2--Calculate Spray Materials Using Emulsifiable Concentrate

  C. Assignment Sheet #3--Interpret Pesticide Labels as to Formulation and Mixing

V. Answers to assignment sheets

VI. Test

VII. Answers to test

# FORMULATION AND APPLICATION
## UNIT VIII

## INFORMATION SHEET

I. Terms and definitions

   A. Formulation--Mixture of one or more active ingredients with other materials needed to make a pesticide easy to store, handle, dilute, and apply

   B. Target--Pest to be controlled with a pesticide

   C. Site--Area, building, plant, or animal to be treated with pesticide in order to protect it from or reach the target pest

   D. Compatible--Able to be combined with other pesticides and applied as a mixture without reducing their effectiveness

   E. Concentrate--Pesticide as it is sold before diluting; usually contains a large amount of active ingredient

   F. Solvent--Liquid such as water, kerosene, or alcohol that a pesticide or other substance will dissolve in and form a solution

   G. Solution--Mixture made by dissolving a substance in a liquid; mixture will not separate or settle out in normal use

II. Types of formulations (Transparency 1)

   A. Dust (D)--Finely ground ready-to-use dry mixture combining a small amount of active ingredient with an inert carrier such as talc, clay, or volcanic ash

   B. Poisonous bait (B)--Food or other attractive substance mixed with an active ingredient that will attract and be eaten by pests and cause their death

   C. Granule (G)--Ready-to-use dry mixture of a small amount of active ingredient and inert carriers with all particles larger than dust particles

   D. Low concentrate solution (S)--Solution which contains a low concentration or small amount of active ingredient in a highly refined oil or other solvent

   (NOTE: These are usually purchased as stock sprays and space sprays and for use in aerosol generators.)

   E. Emulsifiable concentrate solution (EC or E)--Solution which contains a high concentration or large amount of active ingredient which should be mixed with water; may contain from one to several pounds of active ingredient per gallon of concentrate

F. Ultra-low volume concentrate solution (ULV)--Solution which may contain pure active ingredient; usually used without dilution

G. Flowable (F)--Very finely ground solid material which is suspended in a liquid; usually contains a high concentration or large amount of the active ingredient and is mixed with water when applied

H. Wettable powder (WP or W)--Dry preparation which may contain a fairly high concentration (15% - 95%) of active ingredient and is mixed with water to form a suspension when applied

I. Soluble powder (SP)--Dry preparation which contains a fairly high concentration (15% - 95%) of active ingredient that dissolves in water to form a solution for application

J. Fumigant--Active ingredient in the form of a gas or liquid which becomes a gas when applied and reaches the target as a gas

III. Factors to consider in selecting a formulation

A. Effectiveness against the pest

B. Cost of the application

C. Plant, animal, or surface to be protected

D. Possible injury to the protected surface

Example: Phytotoxicity

E. Application equipment which is available

F. Danger of drift or runoff

G. Hazard to the applicator, other persons, plants, and animals

IV. Methods of application and their descriptions (Transparencies 2 and 3)

A. Band--Application to a strip or band over or along each crop row

B. Broadcast--Uniform application to an entire specified area

C. Dip--Complete or partial immersion of a plant, animal, or object in a pesticide

D. Directed--Aiming the pesticide at a portion of a plant, animal, or structure

E. Drench--Saturation of the soil with a pesticide or oral treatment of an animal

F. Foliar--Application to the leaves of a plant, shrub, or tree

G. In-furrow--Application to or in a furrow in which a crop is planted

H. Over-the-top--Application over the top of the growing plant

I. Pour-on--Pouring the pesticide along the midline of the backs of livestock

J. Sidedress--Application along the side of a crop row

K. Soil incorporation--Application to the soil followed by use of tillage implements to mix the pesticide with the soil

L. Spot treatment--Application to a small area

V. Advantages, disadvantages, and principal uses of formulations

| Formulation | Advantages | Disadvantages | Principal Uses |
|---|---|---|---|
| A. Dust | Ready to use; requires no mixing; easy to apply | Drift hazard; expensive | Spot treatment; livestock and poultry; limited foliage use |
| B. Poisonous bait | Ready to use; easy to apply; controls pests that move in and out of the site | Hazardous to children; pest may prefer crop or food to bait; killed pests may cause odor problem | Inside buildings; fruits and vegetables; field crops |
| C. Granule | Ready to use; easy to apply; can be applied to target under dense foliage | Limited foliage use; expensive | Soil treatment |
| D. Low concentrate solution | Ready to use; requires no mixing | Fairly expensive; specialized uses as sprays or aerosols; drift hazard as aerosol | In barns, poultry houses, buildings, greenhouses; small areas; on livestock and poultry |
| E. Emulsifiable concentrate | High concentration; relatively inexpensive; suitable for low pressure equipment with limited agitation | Easy to overdose; may be hazardous to applicator; phytotoxicity | Fruits and vegetables; farm animals; field crops |
| F. Ultra-low volume concentrate solution | Ready to use | Phytotoxicity hazard; danger of overdosing; limited uses | Fruits and vegetables; field crops |
| G. Flowable | Can be mixed with water; reduces nozzle clogging | Requires agitation | Fruits and vegetables; farm animals; field crops |
| H. Wettable powder | Relatively inexpensive; safer than emulsifiable concentrate to use on tender foliage; easy to measure | May be hazardous to applicator; requires mechanical agitation; difficult to mix; may clog nozzles | Fruits and vegetables; farm animals; field crops |
| I. Soluble powder | Easy to mix and measure; no agitation required | May be hazardous to user; not a common formulation | Field crops; fruits and vegetables; farm animals |
| J. Fumigant | Toxic to wide range of pests; will penetrate cracks and crevices and grain | Area must be sealed; requires special protective equipment; dangerous | Inside buildings; greenhouses; farm-stored grain; soil |

## INFORMATION SHEET

VI. Best time to mix pesticides--Immediately before using

VII. Procedure for mixing wettable powders

- A. Fill tank one-half full with water
- B. Start agitator

  (NOTE: Keep agitator going at all times.)
- C. Measure out correct amount of wettable powder
- D. Add powder to a small amount of water in a clean mixing bucket
- E. Stir until well mixed

  (NOTE: This will make a *slurry*, a watery mixture of insoluble matter.)
- F. Add slurry to tank
- G. Finish filling the tank

VIII. Procedure for mixing emulsifiable concentrates

- A. Fill tank one-fourth to one-half full with water
- B. Measure out correct amount of emulsifiable concentrate
- C. Add EC directly into spray tank
- D. Mix thoroughly using mechanical or hydraulic means
- E. Finish filling the tank
- F. Do not use air agitation

IX. Safety precautions when mixing and handling pesticides

- A. Follow all safety precautions stated on the label
- B. Use protective clothing and equipment as stated on the label
- C. Rinse empty containers and measuring cups to remove any residue
- D. Read the label or consult an expert to make sure mixes of two or more pesticides are compatible
- E. Avoid splashes, spills, and leaks

  (NOTE: Clean up any splashes, spills, or leaks.)

# INFORMATION SHEET

F. Wash all contaminated areas on clothing or equipment

G. Dispose of empty containers properly

(NOTE: Other safety precautions may be added by the instructor.)

X. Importance of drift control

A. Is hazardous to the environment

B. May injure wildlife

C. Contaminates water, foliage, and pasture

D. May damage nearby crops and cause illegal residues

E. Is expensive

(NOTE: The applicator is responsible for any injury or money loss on crops due to pesticide drift onto a nontarget area.)

XI. Factors to consider in determining application rate

A. Read the label; never use more than the dosage rate recommended

B. Consult an expert for less than recommended rate

XII. Determining amounts of wettable powder to use

A. Pounds per tank

Problem--Label calls for 3 pounds of 25% WP per acre. Your sprayer holds 50 gallons and applies 10 gallons per acre

$$\frac{\text{50 gallons per tank}}{\text{10 gallons per acre}} \quad \times \quad \begin{matrix}\text{3 pounds}\\ \text{per acre}\end{matrix} \quad = \quad \begin{matrix}\text{15 pounds per}\\ \text{50 gallon tank}\end{matrix}$$

B. Pounds per gallon

Problem--Label calls for 2 pounds of 50% WP per 100 gallons of water. Your tank holds 300 gallons

$$\frac{\text{2 pounds of WP}}{\text{100 gallons of water}} \quad \times \quad \begin{matrix}\text{300 gallons}\\ \text{per tank}\end{matrix} \quad = \quad \begin{matrix}\text{6 pounds}\\ \text{per 300 gallons}\end{matrix}$$

C. Active ingredient per acre

Problem--A local expert recommends that you apply 1/2 pound of active ingredient per acre. You have a 50% WP on hand and your sprayer tank holds 50 gallons. It applies 8 gallons per acre

1 pound of 50% WP per acre = 1/2 pound of active ingredient per acre

$$\frac{\text{50 gallons per tank}}{\text{8 gallons per acre}} \times \text{1 pound per acre} = \text{6 1/4 pounds of 50\% WP per tank to apply 1/2 pound per acre}$$

D. Percentage mixing

1. Formula

(NOTE: It is not necessary to memorize this formula.)

$$\frac{\text{Gals of spray needed} \times \text{\% active ingredient wanted} \times \text{8.3\# per gal of water}}{\text{\% active ingredient in pesticide used}}$$

2. Problem--A local expert recommends using a 1% spray. You already have an 80% WP of the right pesticide and you need 50 gallons of the 1% spray. How much pesticide is needed?

$$\frac{\text{50 gallons} \times 1\% \times \text{8.3\#/gal}}{\text{80\% WP}} = \text{5.18 or 5.2 pounds of pesticide in 50 gallons of water}$$

XIII. Determining amounts of emulsifiable concentrate

A. Pints, quarts, or gallons/acre

Problem--The label recommendation is to apply 2 quarts of 6E per acre. Your sprayer holds 42 gallons and applies 6 gallons per acre

$$\frac{\text{42 gallons per tank}}{\text{6 gallons per acre}} \times \text{2 quarts per acre} = \text{14 quarts per tank}$$

14 quarts = 3 gallons, 2 quarts per tank or 3 1/2 gallons

B. Pints per gallon

Problem--The label says to apply 1/4 pint of 8EC per 100 gallons. Your tank holds 400 gallons. How much of 8EC is needed?

$$\frac{\text{1/4 pint of EC}}{\text{100 gallons of water}} \times \text{400 gallons per tank} = \text{1 pint per 400 gallons}$$

## INFORMATION SHEET

C. Active ingredient per acre

Problem--A local expert recommends you apply 1/2 pound active ingredient per acre. You have a 4E on hand which contains 4 pounds of active ingredient per gallon formulation. Your sprayer holds 40 gallons and applies 6 gallons per acre. How much 4E is needed per tank to apply 1/2 pound active ingredient per acre?

4 pounds active ingredient per gallon = 4 pounds per 4 quarts = 1 pound per 1 quart = 1/2 pound per 1 pint

$$\frac{\text{40 gallons per tank}}{\text{6 gallons per acre}} \times \text{1 pint of 4E per acre} = \text{6 2/3 pints per tank}$$

D. Percentage mixing

1. Formula

(NOTE: It is not necessary to memorize this formula.)

$$\frac{\text{Gallons of spray wanted} \times \text{\% active ingredient} \times \text{8.3 pounds per gallons water}}{\text{Pounds of active ingredient per gallon of concentrate} \times 100}$$

2. Problem--A local expert tells you to apply a 0.5% spray. You already own a 25% EC (2 pounds pesticide per gallon formulation) which must be mixed with water and you need 100 gallons of spray

$$\frac{\text{100 gallons} \times 0.5\% \times \text{8.3\#/gal}}{\text{2 pounds EC} \times 100} = \text{2.07 or 2 gallons}$$

(NOTE: If the EC was to be mixed with oil or kerosene, you would have used 6.6 pounds per gallon not 8.3 pounds per gallon.)

XIV. Liquid and volume measures

A. 1 gallon of water = 8.3 pounds (approx)

(NOTE: One gallon of kerosene weighs 6.6 lbs.)

B. 100 gallons of water = 830 pounds (approx)

C. 1 pound = 16 ounces = 453.6 grams

D. 1 pint = 16 fluid ounces = 473 milliliters

E. 1 quart = 2 pints = 32 fluid ounces = 946 milliliters = .946 liters

F. 1 pound wettable power per 100 gallons = 1 tablespoon per gallon (approx)

G. 1 pint emulsifiable concentrate per 100 gallons = 1 teaspoon per gallon (approx)

(NOTE: Instructor may want to add additional measures.)

# Types of Formulations

## Dry

Dust (D)

Poisonous Bait (B)

Granule (G)

Wettable Powder (WP or W)

Soluble Powder (SP)

## Liquid

Low Concentrate Solution (S)

Emulsifiable Concentrate Solution (EC or E)

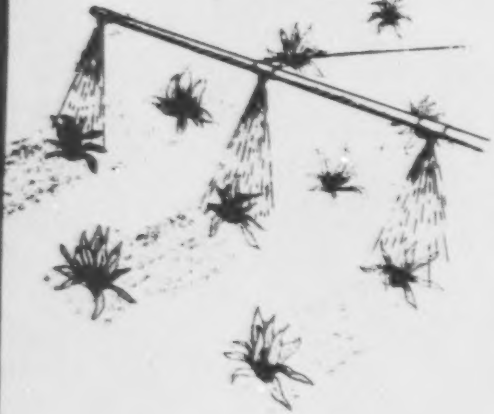
Ultra-Low Volume Concentrate Solution (ULV)

Flowable (F)

## Gas

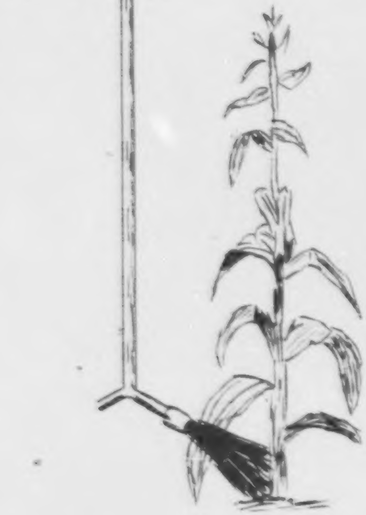
Fumigant

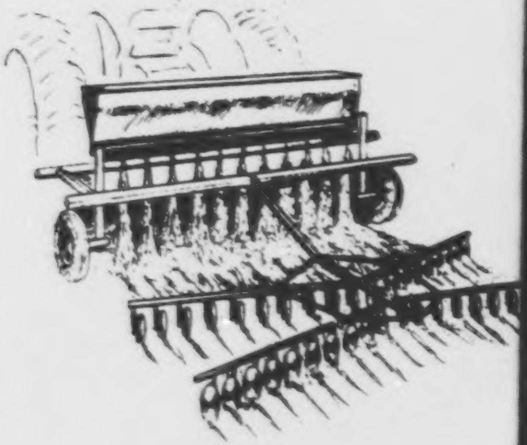
# Methods of Application



Band

Directed

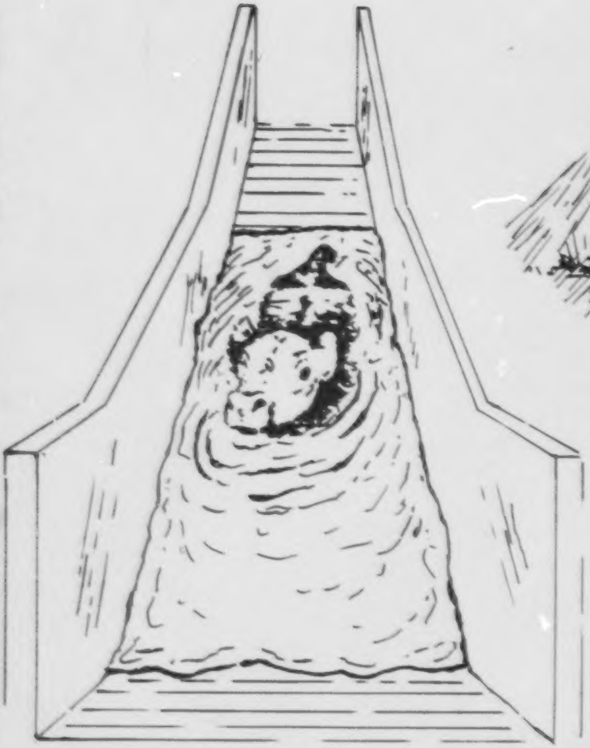




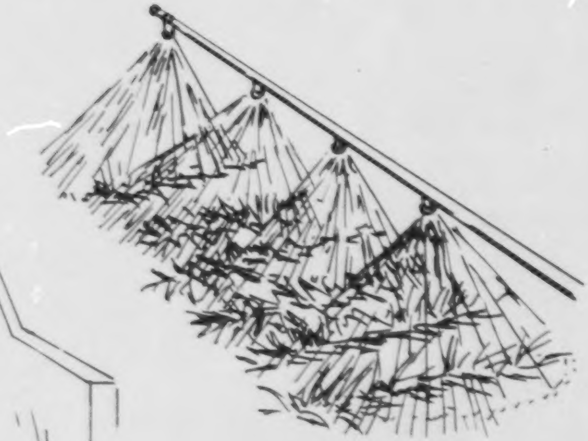
Soil Incorporation

# Methods of Application

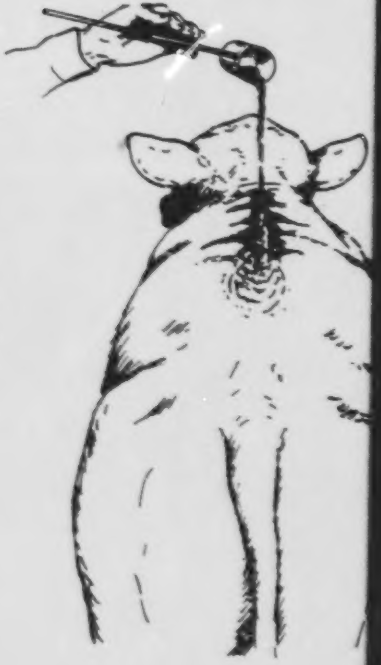
(Continued)



Dipping



Broadcast



Pour-On

## ASSIGNMENT SHEET #1-CALCULATE SPRAY MATERIALS USING WETTABLE POWDER

Calculate the problems below and show your work.

1. How much wettable powder is needed to make 200 gallons of spray if recommended rate is 3 pounds per 50 gallons of water?

2. How many pounds of wettable powder is needed to make 100 gallons of spray if 3 pounds of 60% wettable powder is needed per acre and your sprayer applies 25 gallons per acre?

3. A farmer wants to spray a field of corn. The recommended strength of the spray is 0.5%. The wettable powder recommended is 50% and the spray tank holds 150 gallons. How much 50% WP is required for this mix?

$$\frac{\text{Gallons of spray wanted} \times \text{\% active ingredient needed} \times 8.3 \text{ pounds/gallon}}{\text{\% active ingredient in pesticide used}}$$

# FORMULATION AND APPLICATION
## UNIT VIII

## ASSIGNMENT SHEET #2--CALCULATE SPRAY MATERIALS USING EMULSIFIABLE CONCENTRATE

Calculate the problems below and show your work.

1. How many quarts of 6E is needed to mix 40 gallons if recommended amount is 2 quarts per acre and your sprayer applies 4 gallons per acre?

2. How many pints of 8EC is needed for 400 gallons of spray if recommended rate is 1/2 pint per 100 gallons of water?

3. A farmer wants to mix 200 gallons of 0.3% spray using 50% emulsifiable concentrate (4 pounds pesticide per gallon). How many gallons of concentrate will be needed?

$$\frac{\text{Gallons of spray wanted} \times \text{\% active ingredient} \times 8.3 \text{ pounds per gallon}}{\text{Pounds of active ingredient per gallon of concentrate} \times 100}$$

# FORMULATION AND APPLICATION
## UNIT VIII

## ASSIGNMENT SHEET #3--INTERPRET PESTICIDE LABELS AS TO FORMULATION AND MIXING

Read the labels provided on the following pages and answer the questions below.

1. Using the De Metho label, answer the questions below.

   a. What type of formulation is De Metho?

   b. What is the symbol for the formulation?

   c. Does this formulation go on as is or must it be diluted? If diluted, with what?

   d. How many pounds per gallon of this formulation is active ingredient (methomyl)?

   e. How would you prepare the spray mix using this formulation?

   f. Your tank holds 200 gallons and you want to spray your chrysanthemums which have a severe infestation of cabbage looper.

      1) How many pints of De Metho are needed per 100 gallons?

      2) How much pesticide would you put into your tank?

   g. A local expert recommends that in your area you need a 0.1% spray for cabbage loopers attacking your potatoes. Using the following formula, calculate how many gallons of De Metho you need for 200 gallons of 0.1% spray.

$$\frac{\text{Gallons of spray wanted} \times \text{\% active ingredient wanted} \times \text{8.3 pounds/gallon}}{\text{Pounds of active ingredient per gallon of concentrate} \times 100}$$

2. Using the No-Disease label, answer the questions below.

   a. What type of formulation is No-Disease?

   b. What is the symbol for this formulation?

   c. How many pounds of active ingredient (benomyl) are in the formulation?

   d. Does this formulation go on as is or must it be diluted?

   e. How do you prepare the spray mix using this formulation?

   f. Your tank holds 400 gallons and applies 40 gallons per acre. You want to spray your snapbeans for an expected severe infestation of white rot.

      1) What rate would you use?

      2) How many acres can your sprayer cover before having to refill?

      3) How much would you put into your tank?

   g. A local expert recommends that you need 1/8 pound active ingredient per acre to get good control of powdery mildew on your melons. Your sprayer holds 400 gallons and applies 40 gallons per acre. How much pesticide would you add to the tank?

3. Using the Anti-Weed label, answer the following questions.

   a. What formulation is Anti-Weed?

   b. What is the symbol for this formulation?

   c. Does this go on as is or must it be diluted?

   d. How many pounds of actual ingredient per 50 pounds of Anti-Weed?

   e. How would you prepare this formulation in a mix?

### PRECAUTIONARY STATEMENTS
### HAZARDS TO HUMANS
### (DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing. Wear tightly-woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance, call 000-000-0000.

TO PHYSICIAN: De Metho is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eyes, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable: Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within
24 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposed in approved landfill or buried in a safe place.

Consult Federal, State or local Disposal authorities for approved alternate procedures.

---

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

# DE METHO

INSECTICIDE

Emulsifiable Concentrate

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL | 24% |
| INERT INGREDIENTS: | 76% |
| TOTAL: | 100% |

**Net Content: 50 gallons**

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician immediately.

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and immediately wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

ESTABLISHMENT NO. 1357-VT-1
EPA REGISTRATION NO. 1357-43

---

### DIRECTIONS FOR USE
### CONTINUED
### SPRAY PREPARATION

Fill spray tank ½ to ¾ full of water. Add De Metho directly to spray tank and mix thoroughly, using mechanical or hydraulic means; do not use air agitation.

### APPLICATION

Apply at the recommended rates when insects first appear. Unless otherwise noted, continue applications at 5- to 7-day intervals or as needed. Use sufficient water (8-15 gals per acre by air) to obtain thorough, uniform coverage. Apply the low rates on small plants, small worms and light infestations of insects. Use intermediate rates on larger worms and heavier infestations of insects. Use 1 to 3 applications of the highest recommended rate for controlling severe infestations. Thereafter, use the lowest rate possible to maintain control.

### NOTICE TO BUYER

Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of the product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

### CROP USAGE

| CROPS [illegible] | INSECTS | PINTS PER ACRE | LAST APPLICATION DAYS<br>TO HARVEST | <br>TO LIVESTOCK GRAZING/FEEDING |
|---|---|---|---|---|
| [illegible] A G | [illegible] | 2-4 | | 7 |
| [illegible] G | [illegible] | 1-2 | | 3 [illegible] |
| | [illegible] | 2 | 3 | 7 [illegible] |
| [illegible] | [illegible] | 1-2* | 7 | |
| [illegible] A G | [illegible] | 2-4* | 14 | |
| [illegible] A G | [illegible] | 2-4* | 14 | |
| [illegible] A G | [illegible] | 1-4* | 3 | |
| [illegible] A G | [illegible] | 4 | 14 | |
| [illegible] | [illegible] | 1 1/2-2 | 3 | |
| | [illegible] | 1-2 | | |
| A G | [illegible] | 3 | [illegible] | 3 [illegible] |
| [illegible] G | [illegible] | 2-4 | 3 | |
| [illegible] | [illegible] | 1-2 | 7 | |
| A G | [illegible] | 2-4 | 10 | - |
| [illegible] G | [illegible] | 2-4 | 3 | |
| [illegible] G | [illegible] | 1-4 | 21 | [illegible] |
| [illegible] A G | [illegible] | 2 | 10 | |
| [illegible] | [illegible] | 2 | 10 | |
| | [illegible] | 2-4 | | |
| A G | [illegible] | 2 | | |
| [illegible] G | [illegible] | 2-4 | 3 | |
| [illegible] | [illegible] | 2 | 3 | |
| A G | [illegible] | [illegible] 2-4 | 3 | |
| [illegible] | [illegible] | 1-2 | 7 [illegible] | |
| A G | [illegible] | 2 | [illegible] | |
| [illegible] | [illegible] | 1-2 [illegible] per 100 gal. | | |

*[illegible]

ASSIGNMENT SHEET #3

SPECIMEN

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with.

**ALMONDS: Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and/or highly susceptible varieties, make a second application during half to full bloom.

**APPLES, PEARS:** Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP): White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH: Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII): Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES: Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS: Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 35 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL

# NO-DISEASE

## BENOMYL FUNGICIDE

**Wettable Powder**

| | |
|---|---|
| **ACTIVE INGREDIENT** | |
| **Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate]** | **50%** |
| **INERT INGREDIENTS** | **50%** |

U.S. Pats. 3,541,213 & 3,631,176 EPA Est. 1352-WV-1 EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN

Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing. Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

**NET 50 LBS.**

B-21150 B 73A Made in U.S.A. Printed in U.S.A.

## KILL-DEAD CHEMICALS

Chemical City, West Virginia

**PECANS: Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may be added to the spray to improve wetting of foliage. Apply at prepollination when young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE: Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. per 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thorough wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom; apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 weeks after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by **Rhizopus** spp. and **Alternaria** spp.

**STRAWBERRIES: Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Leaf Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue at 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acre when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS: Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals as needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII): Pineapple Disease (Ceratocystis paradoxa)**—Apply to cut seedpieces either as a cold dip or hot dip.

Cold Dip—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to give thorough wetting; remove and allow to drain.

Hot Dip—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of the dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES (Powdery Mildew, Black Spot); FLOWERS, ORNAMENTALS (Powdery Mildew, Botrytis Gray Mold):** Field and Greenhouse—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, use 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-day intervals throughout the growing season; shorten interval during humid, rainy weather. Addition of a surfactant to the spray mixture enhances curative action of the fungicide, and improves distribution of the spray on hard-to-wet plants such as roses.

**BULBS (Easter Lily, Tulip, Gladiolus, Daffodil, Iris); Fusarium and Penicillium Rots**—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak cleaned bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hours after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bulbs have been heat-cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

ASSIGNMENT SHEET #3

# Anti-Weed

## 20G

SAMPLE LABEL

**Herbicide**

FOR WEED CONTROL
IN CORN

Active Ingredients:
Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . 20.0%

Inert Ingredients: 80.0%
Total: 100.0%

Anti-Weed 20G is a granular herbicide

**Warning:**

**Keep out of reach of children. See additional warning statements on back of bag.**

**50**
**Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

**KILL-DEAD**
**Chemical Company**
Chemical City, West Virginia

# ASSIGNMENT SHEET #3

## DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

**IMPORTANT:** Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

### Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of Kill-Dead or the Seller. All such risks shall be assumed by the Buyer.

Kill-Dead warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks referred to above. Kill-Dead **makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty.** In no case shall Kill-Dead or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. Kill-Dead and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of Kill-Dead Chemical Company.

### General Information

Anti-Weed will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since Anti-Weed acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

Anti-Weed is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using Anti-Weed where adjacent desirable trees, shrubs or plants might be injured.

Store Anti-Weed in a dry place.

**Application Instructions**

Broadcast or Overall Treatment

Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment

Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \text{Recommended Broadcast Rate} = \begin{array}{l}\text{lbs./Acre}\\ \text{Anti-Weed}\\ \text{for Band}\\ \text{Treatment}\end{array}$$

Range of Rates: In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

### Directions for Use

Anti-Weed controls most annual broadleaf and grass weeds such as:

Giant Foxtail
Green Foxtail
Yellow Foxtail
Barnyardgrass
(Watergrass)
Crabgrass

Fall Panicum
Annual Morningglory
Cocklebur
Sandbur
Jimsonweed
Lambsquarters

Mustard
Pigweed
Ragweed
Smartweed
Sunflower
Velvetleaf

Anti-Weed will not control perennial weeds such as:

Johnsongrass Field Bindweed Canada Thistle Bull Nettle

Apply Anti-Weed at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| Soil | Rate per acre of Anti-Weed Broadcast* |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs. |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–<br>30 lbs. |

*For calculation of band treatment rate, see Application Instructions Section.

** Anti-Weed should not be used on high organic soils such as peat and muck.

**Suggestions for Crop Rotations**

1) Corn may be replanted at any time following application of Anti-Weed. 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions:** 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following Anti-Weed application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

### Warning

Keep out of reach of children.

Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.

This product is toxic to fish. Keep out of lakes, ponds and streams.

Do not reuse container. Destroy when empty.

## FORMULATION AND APPLICATION
## UNIT VIII

## ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. 12 pounds
2. 12 pounds
3. 12.45 pounds or 12 1/2 pounds

Assignment Sheet #2

1. 20 quarts
2. 2 pints
3. 1.25 gallons

Assignment Sheet #3

1. a. Emulsifiable concentrate
   b. EC or E
   c. Diluted with water
   d. 1.8 pounds
   e. Fill spray tank 1/4 to 1/2 full of water. Add correct amount of De Metho directly to spray tank and mix thoroughly, using mechanical or hydraulic means. Fill spray tank the rest of the way. Do not use air agitation.
   f. 1) 2 pints/100 gallons
      2) 4 pints or 2 quarts
   g. One gallon
2. a. Wettable powder
   b. WP or W
   c. 50% of 50 pounds = 25 pounds
   d. Diluted

260

e. Fill tank 1/2 full with water. Start agitator. Measure the correct amount of WP and add to a small amount of water in a clean mixing bucket; stir well until mixed. Add slurry to tank. Finish filling the tank with water.

f. 1) 2 pounds per acre

   2) 10 acres

   3) 20 pounds per tank

g. 2 1/2 pounds of No-Disease

3. a. Granular

   b. G

   c. As is

   d. 20% of 50 = 10 pounds

   e. You would not mix

261

## FORMULATION AND APPLICATION
## UNIT VIII

### TEST

1. Match the terms on the right to the correct definitions.

_____a. Area, building, plant, or animal to be treated with pesticide in order to protect it from or reach the target pest

_____b. Pesticide as it sold before diluting; usually contains a large amount of active ingredient

_____c. Pest to be controlled with a pesticide

_____d. Mixture of one or more active ingredients with other materials needed to make a pesticide easy to store, handle, dilute, and apply

_____e. Able to be combined with other pesticides and applied as a mixture without reducing their effectiveness

_____f. Mixture made by dissolving a substance in a liquid; mixture will not separate or settle out in normal use

_____g. Liquid such as water, kerosene, or alcohol that a pesticide or other substance will dissolve in and form a solution

1. Formulation
2. Target
3. Site
4. Compatible
5. Concentrate
6. Solvent
7. Solution

2. Match the types of pesticide formulations on the right to the correct descriptions.

_____a. Dry preparation which may contain a fairly high concentration (15% - 95%) of active ingredient and is mixed with water to form a suspension when applied

_____b. Dry preparation which contains a fairly high concentration (15% - 95%) of active ingredient that dissolves in water to form a solution for application

_____c. Active ingredient in the form of a gas or liquid which becomes a gas when applied and reaches the target as a gas

_____d. Finely ground ready-to-use dry mixture combining a small amount of active ingredient with an inert carrier such as talc, clay, or volcanic ash

_____e. Very finely ground solid material which is suspended in a liquid; usually contains a high concentration or large amount of the active ingredient and is mixed with water when applied

_____f. Food or other attractive substance mixed with an active ingredient that will attract and be eaten by pests and cause their death

_____g. Ready-to-use dry mixture of a small amount of active ingredient and inert carriers with all particles larger than dust particles

_____h. Solution which may contain pure active ingredient; usually used without dilution

_____i. Solution which contains a high concentration or large amount of active ingredient which should be mixed with water; may contain from one to several pounds of active ingredient per gallon of concentrate

_____j. Solution which contains a low concentration or small amount of active ingredient in a highly refined oil or other solvent

1. Dust (D)
2. Fumigant
3. Wettable powder (WP or W)
4. Soluble powder (SP)
5. Emulsifiable concentrate solution (EC or E)
6. Ultra-low volume concentrate solution (ULV)
7. Flowable (F)
8. Granule (G)
9. Low concentrate solution (S)
10. Poisonous bait (B)

3. List two factors an applicator must consider when selecting a formulation.

a.

b.

4. Match the methods of pesticide application on the right to the correct descriptions.

_____a. Complete or partial immersion of a plant, animal, or object in a pesticide

_____b. Application to a small area

_____c. Aiming the pesticide at a portion of a plant, animal, or structure

_____d. Application to the soil followed by use of tillage implements to mix the pesticide with the soil

_____e. Saturation of the soil with a pesticide or oral treatment of an animal

_____f. Application along the side of a crop row

_____g. Application to the leaves of a plant, shrub, or tree

_____h. Pouring the pesticide along the midline of the backs of livestock

_____i. Application to a strip or band over or along each crop row

_____j. Application over the top of the growing plant

_____k. Uniform application to an entire specified area

_____l. Application to or in a furrow in which a crop is planted

1. Band
2. Broadcast
3. Dip
4. Directed
5. Drench
6. Foliar
7. In-furrow
8. Over-the-top
9. Pour-on
10. Sidedress
11. Soil incorporation
12. Spot treatment

5. Discuss the advantages, disadvantages, and principal uses of the following formulations.

| Formulation | Advantages | Disadvantages | Principle Uses |
|---|---|---|---|
| a. Dust | | | |
| b. Emulsifiable concentrate | | | |
| c. Wettable powder | | | |

6. Select from the list below the best time to mix pesticides by placing an "X" in the blank.

_____ a. 24 hours before using

_____ b. 48 hours before using

_____ c. Immediately before using

_____ d. 6 weeks before using

7. List in the proper sequence the procedure for mixing wettable powders.

a.

b.

c.

d.

e.

f.

g.

8. List in the proper sequence the procedure for mixing emulsifiable concentrates.

a.

b.

c.

d.

e.

f.

9. List three safety precautions to observe when mixing and handling pesticides.

a.

b.

c.

10. Describe the importance of drift control.

11. List two factors to consider in determining the application rate.

a.

b.

12. Calculate the following problem to determine the amount of wettable powder to use. Use the following formula and show your work.

$$\frac{\text{Gals of spray needed} \times \text{\% active ingredient wanted} \times \text{8.3\# per gallon of water}}{\text{\% active ingredient in pesticide used}}$$

Problem: A local expert recommended using a 0.2% spray. You have on hand a 50% wettable powder of the right pesticide and you need 75 gallons of the spray. How much pesticide is needed?

13. Calculate the problem below determining the amount of emulsifiable concentrate to use. Show your work.

Problem: The label recommends using 3 pints per acre of 6E. Your sprayer holds 60 gallons and applies 6 gallons per acre. How much 6E is needed?

14. Complete the following chart of liquid and volume measures.

a. 1 gallon of water = __________ pounds (approx)

b. 1 pint = __________ fluid ounces = 473 milliliters

c. 1 quart = __________ pints = 32 fluid ounces = 946 milliliters

d. 1 pound wettable powder per 100 gallons = __________ tablespoon per gallon (approx)

15. Interpret the De Weed label provided on page 316 and answer the questions below.

a. What is the type of formulation?

b. What is the symbol for the formulation?

c. With what do you dilute this formulation?

d. How many pounds of active ingredient are in this formulation?

267

quack grass in your blueberries and want to make one application to get rid of it.

1) How many acres can your sprayer cover without having to refill?

2) What dose (rate) would you use?

3) How much pesticide would you measure into your tank?

### PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (CAUTION)

Harmful if swallowed. Avoid application directly to humans. Care should be taken to avoid inhalation of dust or spray mist, or prolonged contact with skin. In case of contact, immediately flush eyes or skin with large amounts of water. Get medical attention if irritation persists. Wear safety goggles or face shield when handling.

### ENVIRONMENTAL HAZARDS

Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from target area.

### DIRECTIONS FOR USE GENERAL CLASSIFICATION

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be disposed of in an incinerator or landfill approved for pesticide containers, or buried in a safe place. Consult Federal, State, or local disposal authorities for approved alternate procedures such as limited open burning.

# DE WEED

HERBICIDE
WETTABLE POWDER

| | |
|---|---|
| ACTIVE INGREDIENT: weedout · tri-azoic acid | 80.0% |
| INERT INGREDIENTS: | 20.0% |
| TOTAL: | 100.0% |

## KEEP OUT OF REACH OF CHILDREN

## CAUTION

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED Induce vomiting
IF INHALED Remove to fresh air
IF IN EYES Flush eyes with plenty of water
IF ON SKIN Remove clothing and wash with detergent and water

MFG BY A-Z CHEMICALS
Aster, Minnesota

EPA ESTABLISHMENT NO. 1357-MN-1
EPA REGISTRATION NO. 1357-41

### DIRECTIONS FOR USE CONTINUED

DeWeed is for weed control in certain crops, ornamental plantings, on industrial sites, and around-the-farm. It should be applied before weeds emerge or following removal of weed growth. It controls a wide variety of annual broadleaf and grass weeds when used at selective rates in agricultural crops and ornamental plantings. When used at higher, non-selective rates in non crop areas, it also controls many perennial broadleaf and grass weeds.

GROUND APPLICATION: Use conventional spray equipment with 80° flat-fan nozzles. Screens in spray system should be no finer than 50 mesh. Use a pump with capacity to maintain 35-40 psi at nozzles. Use hydraulic or mechanical agitation during mixing and application to maintain a uniform suspension. Aerial application: Use only where specified in the use directions.

BLUEBERRIES and CANEBERRIES (blackberries, boysenberries, loganberries, raspberries)—Quackgrass. Apply 5 lbs per acre in the fall or split the application applying 2½ lbs per acre in the fall plus 2½ lbs per acre in the spring, when quackgrass is growing. Do not apply when fruit is present.

ALFALFA—Pure alfalfa less than one year old (Northeastern U.S. only)—Henbit, wild mustard, chickweed, alyssum, downy brome, wild oats, and pigweed. Pure alfalfa which has been seeded in the spring (before June 1) may be treated in the fall after the last cutting but before frozen ground conditions. Apply 1 lb. of DeWeed per acre. For ground application apply in a minimum of 2½ gals. of water per acre.

GRASSES GROWN FOR SEED (Pacific Northwest only) Perennial ryegrass, tall fescue and fine fescues, such as Pennlawn, Chewings, Ranier, and related species. Control of broadleaf weeds and annual grasses including annual ryegrass, rattail fescue, silver hairgrass and downy brome. Apply 2½ lbs of DeWeed in a minimum of 15 gals of water per acre as soon as fall rains start. Apply only to grasses from which at least one seed crop has been cut.

WEED CONTROL on industrial sites, highway medians, and shoulders, railroad rights-of-way, lumber yards, and in non-crop areas on farms such as around buildings, fuel storage areas, along fences, roadsides, and lanes. Aerial application may be made where it is feasible. Use at least 1 gal of water for each 1 lb. of DeWeed; use more water if practical for both ground and aerial application. To control annual broadleaf and grass weeds (including barnyard grass, cheat, crabgrass, lambsquarters, foxtail, ragweed, puncturevine and mullein), apply 6-12½ lbs. per acre. To control most annual and many perennial broadleaf and grass weeds (including quackgrass, bluegrass, redtop, burdock, Canada thistle, orchardgrass, dogfennel, and plantain), apply 12½-25 lbs. per acre. To control hard-to-kill perennial weeds (including bull thistle and sow thistle), apply 35-60 lbs. per acre.

NET WEIGHT FIVE POUNDS

# FORMULATION AND APPLICATION
## UNIT VIII

## ANSWERS TO TEST

1. a. 3
   b. 5
   c. 2
   d. 1
   e. 4
   f. 7
   g. 6
2. a. 3
   b. 4
   c. 2
   d. 1
   e. 7
   f. 10
   g. 8
   h. 6
   i. 5
   j. 9
3. Any two of the following:
   a. Effectiveness against the pest
   b. Cost of the application
   c. Plant, animal, or surface to be protected
   d. Possible injury to the protected surface
   e. Application equipment which is available
   f. Danger of drift or runoff
   g. Hazard to the applicator, other persons, plants, and animals
4. a. 3
   b. 12
   c. 4
   d. 11
   e. 5
   f. 10
   g. 6
   h. 9
   i. 1
   j. 8
   k. 2
   l. 7

5. Discussion should include:

| Formulation | Advantages | Disadvantages | Principal Uses |
|---|---|---|---|
| a. Dust | Ready to use; requires no mixing;<br>easy to apply | Drift hazard; expensive | Spot treatment; livestock and poultry; limited foliage use |
| b. Emulsifiable concentrate | High concentration; relatively inexpensive; suitable for low pressure equipment with limited agitation | Easy to overdose; may be hazardous to applicator; phytotoxicity | Fruits and vegetables; farm animals; field crops |
| c. Wettable powder | Relatively inexpensive; safer than emulsifiable concentrate to use on tender foliage; easy to measure | May be hazardous to applicator; requires mechanical agitation; difficult to mix; may clog nozzles | Fruits and vegetables; farm animals; field crops |

6. c

7. a. Fill tank one-half full with water
   b. Start agitator
   c. Measure out correct amount of wettable powder
   d. Add powder to a small amount of water in a clean mixing bucket
   e. Stir until well mixed
   f. Add slurry to tank
   g. Finish filling the tank

8. a. Fill tank one-fourth to one-half full with water
   b. Measure out correct amount of emulsifiable concentrate
   c. Add EC directly into spray tank
   d. Mix thoroughly using mechanical or hydraulic means
   e. Finish filling the tank
   f. Do not use air agitation

9. Any three of the following:
   - a. Follow all safety precautions stated on the label
   - b. Use protective clothing and equipment as stated on the label
   - c. Rinse empty containers and measuring cups to remove any residue
   - d. Read the label or consult an expert to make sure mixes of two or more pesticides are compatible
   - e. Avoid splashes, spills, and leaks
   - f. Wash all contaminated areas on clothing or equipment
   - g. Dispose of empty containers properly

10. Description should include:
    - a. Is hazardous to the environment
    - b. May injure wildlife
    - c. Contaminates water, foliage, and pasture
    - d. May damage nearby crops and cause illegal residues
    - e. Is expensive

11. a. Read the label; never use more than the dosage rate recommended
    - b. Consult an expert for less than recommended rate

12. 2.5 lbs per 75 gallons of water

13. 30 pints or 15 quarts or 3 gallons and 3 quarts

14. a. 8.3
    - b. 16
    - c. 2
    - d. 1

15. a. Wettable powder
    - b. WP or W
    - c. Water
    - d. 80% of 5 pounds = 4 pounds
    - e. 1) 10 acres
      - 2) 5 pounds per acre
      - 3) 50 pounds

# EQUIPMENT AND ITS USE
## UNIT IX

## TERMINAL OBJECTIVE

After completion of this unit, the student should be able to identify types of equipment used to apply pesticides, describe the procedure for calibrating the equipment, and calculate problems involving calibration. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

## SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with pesticide equipment and their uses to the correct definitions.
2. Identify types of pesticide application equipment.
3. List types of support equipment needed for application of pesticide.
4. Discuss in a short paragraph the importance of choosing the proper equipment when applying pesticides.
5. Complete a chart listing the advantages and disadvantages of common types of application equipment.
6. List safety precautions to observe when cleaning and storing equipment after use.
7. Match types of nozzles to the correct descriptions.
8. Tell why it is important to calibrate equipment.
9. Describe the procedure for calibrating pesticide application equipment by arithmetic calculation.
10. Calculate problems involving pesticide equipment calibration.

# EQUIPMENT AND ITS USE
## UNIT IX

## SUGGESTED ACTIVITIES

I. Instructor:

   A. Provide student with objective sheet.

   B. Provide student with information and assignment sheets.

   C. Make transparencies.

   D. Discuss terminal and specific objectives.

   E. Discuss information and assignment sheets.

   (NOTE: Instructors may want to provide additional assignment sheets using labels common to the local community. Assignment Sheet #2 is optional and should be completed only if nomographs are used in the local community.)

   F. Borrow equipment from local dealers or farms and allow student to practice calibrating equipment using any method.

   (CAUTION: Use water, not pesticides.)

   G. Survey farms and determine which types of equipment are used most often in your area. Discuss why.

   H. Give test.

II. Student:

   A. Read objective sheet.

   B. Read and study information sheet.

   C. Complete assignment sheets.

   D. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

  A. TM 1--Types of Pesticide Application Equipment

  B. TM 2--Types of Pesticide Application Equipment (Continued)

  C. TM 3--Types of Pesticide Application Equipment (Continued)

  D. TM 4--Types of Nozzles

  E. TM 5--Sprayer Calibration Nomograph

IV. Assignment sheets

  A. Assignment Sheet #1--Calculate Problems Involving Pesticide Equipment Calibration

  B. Assignment Sheet #2--Calculate Problems Using Nomograph

V. Answers to assignment sheets

VI. Test

VII. Answers to test

275

# EQUIPMENT AND ITS USE
## UNIT IX

## INFORMATION SHEET

I. Terms and definitions

  A. Dilute--To make a pesticide thinner or weaker by adding water, oil, or other material

  B. Concentrate--Pesticide as it is sold before diluting; usually contains a large amount of the active ingredient

  C. Diluent--Liquid or dust used to water down or weaken a concentrated pesticide

  D. Formulation--Mixture of one or more active ingredients with other materials needed to make it easy to store, handle, dilute, and apply

  E. Target--Pest intended to be controlled with pesticide

  F. Site--Area, building, plant, or animal to be treated with the pesticide in order to protect it from or reach a target pest

  G. Compatible--Able to be combined with other pesticides and applied as a mixture without reducing their effectiveness

  H. Adjuvant (additive)--Substance added to the pesticide formulation or tank mix to make the active ingredient work better

  Examples: Wetting agent, spreaders, adhesive, emulsifying agent, penetrant

  I. Calibration--Measurement of how much pesticide will be applied by the equipment to the site; measurement of the delivery rate

II. Types of pesticide application equipment (Transparencies 1, 2, and 3)

  A. Hand sprayer

  B. Low pressure field sprayer

  C. High pressure field sprayer

  D. Air blast sprayer or mist blower

  E. Ultra-low volume sprayer

F. Hand duster

G. Power duster

H. Granular applicator

I. Fumigant applicator

J. Aerosol generator

K. Fogger

L. Aerosol bomb

M. Back rubber

N. Dust bag

O. Dipping vat

P. Airplane

Q. Paintbrush

III. Support equipment

(NOTE: Support equipment is used in addition to application equipment.)

A. Filler pump

B. Tank truck

C. Nurse or mixing tank

D. Front-end loader

E. Tractor

IV. Importance of choosing proper equipment

A. Saves time

B. Saves money

C. Provides more thorough application

D. Applies pesticides correctly

# INFORMATION SHEET

## V. Advantages and disadvantages of application equipment

| EQUIPMENT | ADVANTAGES | DISADVANTAGES |
|---|---|---|
| A. Aerosol (bomb and generator) | Penetrates cracks and crevices; usually reaches all pests within the area; area can be used soon after treatment by ventilating | No deposit, therefore reaches only the pests in the area during application; difficult to get long term control; special pesticide formulation necessary; drift hazard |
| B. Duster (hand and power) | Lightweight; inexpensive; requires no water | Drift hazard; high cost of pesticide; hard to control amount of application; must calibrate for each product |
| C. Back rubber (rubbing post, dust bag) | Can work over a long period of time; relatively inexpensive; portable | Livestock only; cannot control amount of application; all animals may not use applicator |
| D. Granular applicator | Lightweight; no water needed; often used in fertilizer spreader or seeder | High cost of pesticide; limited foliar use; must calibrate for each size of granule |
| E. Hand sprayer | Economical; simple; easy to use and clean | Not practical for large areas; lacks agitation; wettable powder may clog nozzles |
| F. Air-blast sprayer | Good coverage and penetration; low pressure pump; mechanical agitation | Drift hazard; chance of overdose; difficult to use in small areas; hard to confine discharge to a limited target |
| G. Low pressure field sprayer | Low cost; lightweight; versatile; covers large areas rapidly | Low volume output limits pesticide penetration; agitation is limited |
| H. High pressure field sprayer | Well-built; long life; usually has mechanical agitation; very versatile | Expensive; requires large amounts of water, power, and fuel; heavy tire loads; drift hazard |
| I. Ultra-low volume sprayer | No water is needed; equal control with less pesticide | Does not provide for thorough wetting; hazard in using high concentrations; chance of overdose; small numbers of pesticides can be used |

VI. Safety precautions when cleaning and storing equipment

A. Wear protective clothing and equipment as called for on the label

B. Follow ALL safety precautions stated on the label

C. Check equipment for leaks

D. Use all of the pesticide mix in the sprayer

E. Wash equipment before storing

F. Release pressure

G. Wash out tank and flush nozzles with clean water; dispose of residue properly

VII. Types of nozzles (Transparency 4)

A. Solid stream--Compact jet used in handguns to spray a distant target or fixed to apply a narrow band or to inject into the soil

B. Regular flat fan--Narrow oval pattern with lighter edges; used for broadcast spraying

C. Flooding flat fan--Wide angle spray pattern; used for broadcast spraying

D. Even flat fan--Uniform pattern across its width; used for band spraying

E. Hollow cone--Circular pattern with little or no spray in the center; used for spraying foliage

F. Solid (full) cone--Circular pattern; used for spraying foliage

G. Broadcast--Wide flat fan pattern; used for boomless sprayers or to extend the effective width on the end of the boom

VIII. Importance of calibrating equipment

A. Obtain desired control

B. Practice good economics

C. Apply proper dosage of the pesticide

(NOTE: Avoid overdosing.)

IX. Procedure for calibrating equipment

(NOTE: One can calibrate several ways, with or without arithmetic or by using a nomograph. A nomograph is a carefully plotted chart used to determine the missing factor.)

A. Measurement method

1. Measure off an acre (100 feet x 436 feet)
2. Fill tank with water
3. Spray the acre
4. Refill tank to determine amount used

   Example: 10 gallons to refill; application rate is 10 gallons per acre

   (NOTE: This tells you how much of the mixture you would apply.)

5. Read label to determine mixing rate

B. Arithmetic calibration

1. Determine pumping rate
   a. Fill spray tank completely full of water
   b. Put vehicle in neutral at the throttle setting (rpm) desired
   c. Open the spray valve and pump for a predetermined time
   d. Close valve, shut down the equipment, and measure the amount of water needed to refill the tank
   e. Divide the number of gallons by time to get pumping rate

      Example: $\frac{\text{10 gallons needed to refill tank}}{\text{5 minutes}}$ = 2 gal/min pumping rate

2. Determine gallons per acre
   a. Determine the number of feet the sprayer moves in one minute at the desired speed and throttle
   b. Measure the width of the sprayer boom

28

c. Determine the pumping rate

d. Figure the area that the sprayer covered in one minute (distance traveled x boom width)

(NOTE: One mile per hour equals 88 feet per minute.)

Example: 440 feet traveled in one minute x 20 feet boom width = 8800 square feet covered per minute

e. Figure how many minutes it would take to spray one acre (divide 43,560 by the area covered in one minute)

(NOTE: One acre equals 43,560 square feet.)

Example: 43,560 square feet ÷ 8800 square feet = 4.95 minutes or 5 minutes per acre

f. Figure the amount of spray pumped per acre (pumping rate x number of minutes per acre)

Example: 2 gallons per minute x 5 minutes per acre = 10 gallons per acre

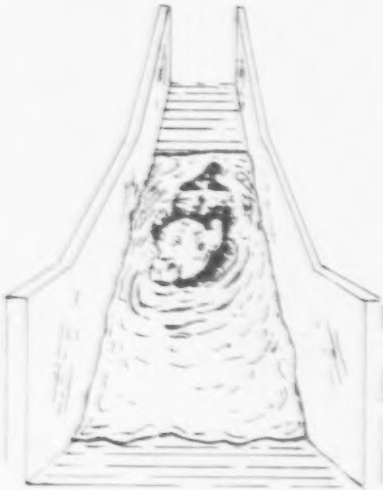
C. Use of nomograph (Transparency 5)

(NOTE: This method is not used in all areas of the country.)

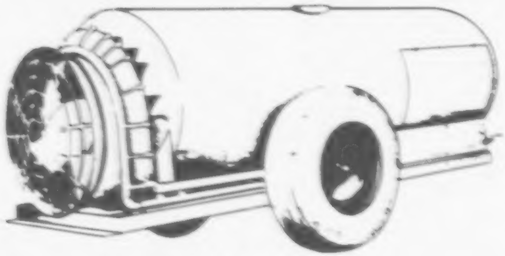
Example: Sprayer ground speed is 4 mph, nozzle spacing is 20 inches, and desired application rate is 20 gal/acre

Solution: Using a straightedge, draw a line from 4 mph on the "speed line" through 20 inches on "nozzle spacing line" and locate point where line intercepts "pivot line". Now draw a line through intercept point on "pivot line" and through 20 gal/acre on "application rate line" and locate point where line intercepts "calibration check line". Read either 35 oz/min or 0.27 gal/min. Select nozzle size to give 0.27 gal/min at desired pressure. Adjust pressure regulator to give a flow rate of 35 oz/min from each nozzle.

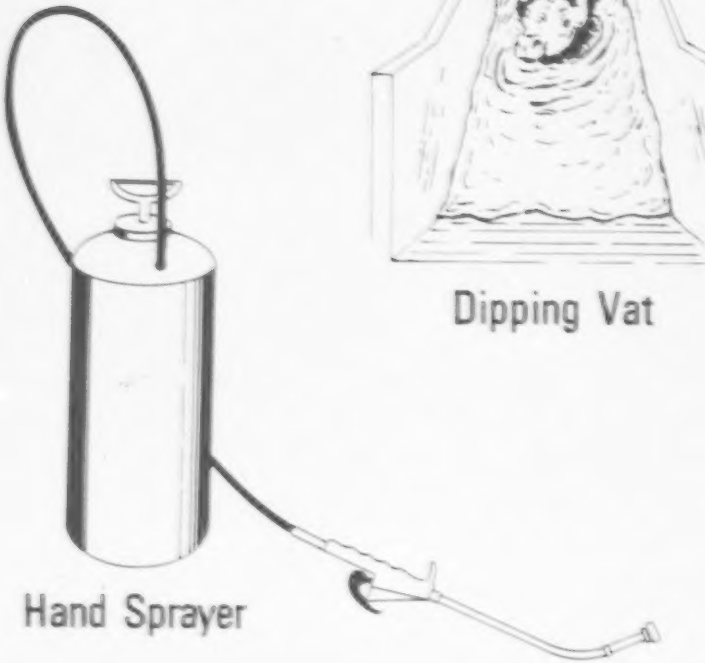
# Types of Pesticide Application Equipment



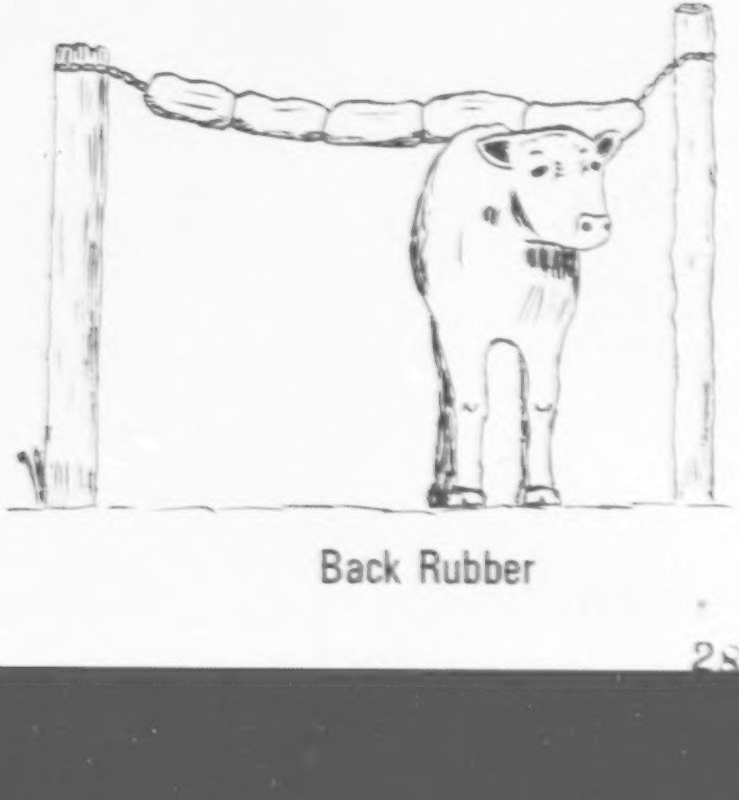
Dipping Vat



Air Blast Sprayer
or Mist Blower



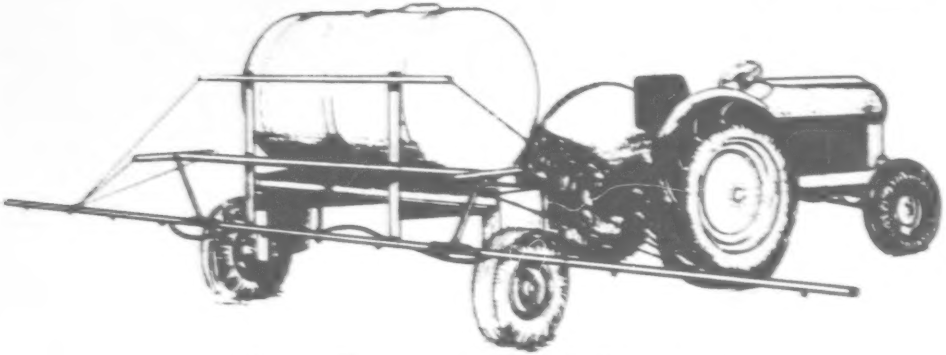
Hand Sprayer



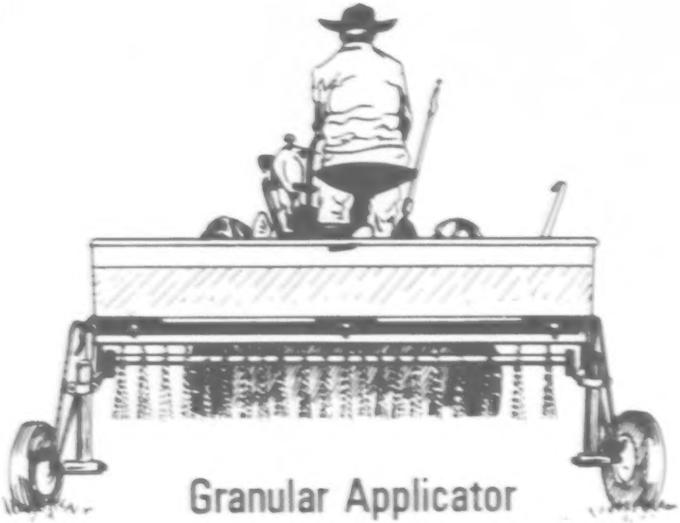
Back Rubber

# Types of Pesticide Application Equipment

(Continued)

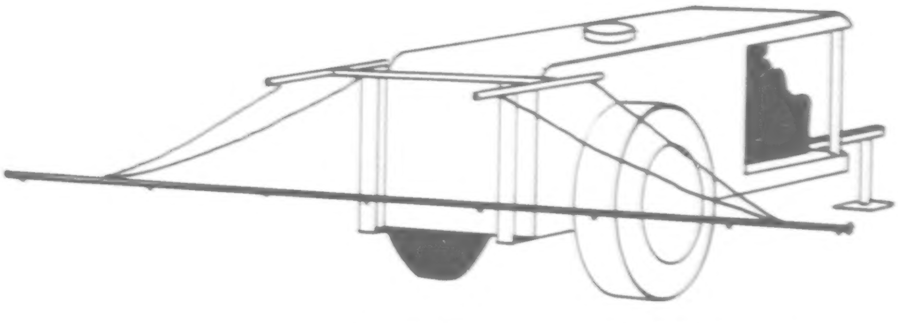


Low Pressure Field Sprayer

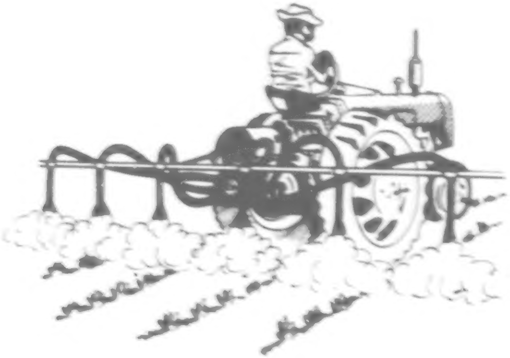


Granular Applicator

333



High Pressure Field Sprayer

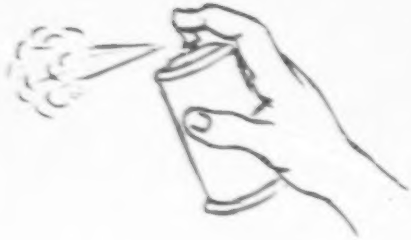


Power Duster

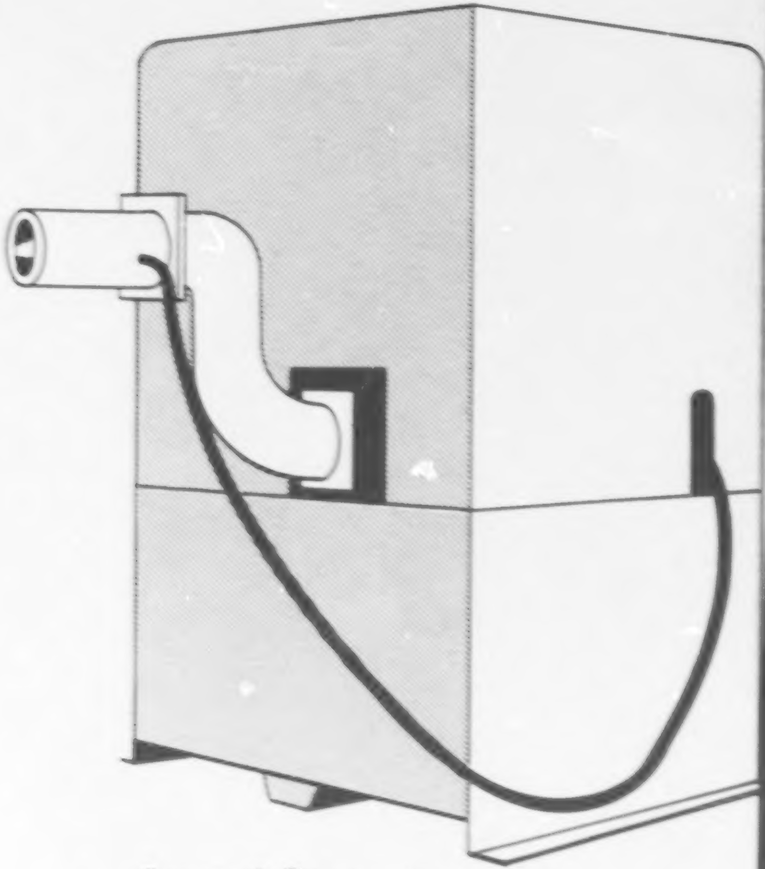
TM 2

# Types of Pesticide Application Equipment

(Continued)

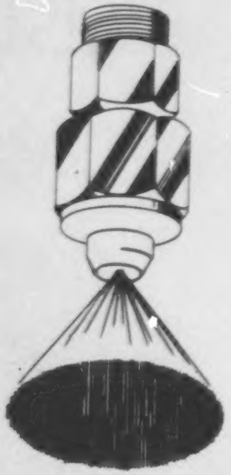


Aerosol Bomb

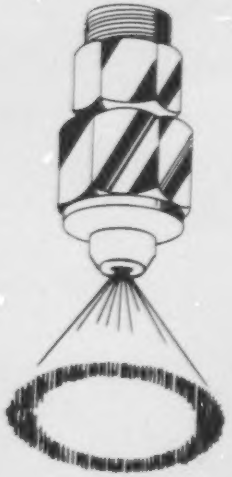


Aerosol Generator

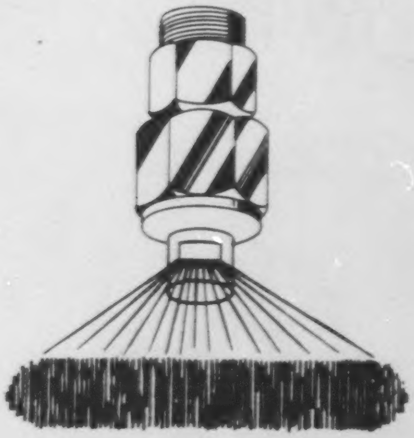
# Types of Nozzles



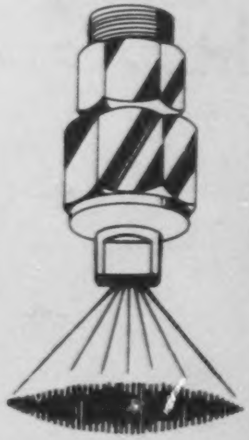
Solid (Full)
Cone Nozzle



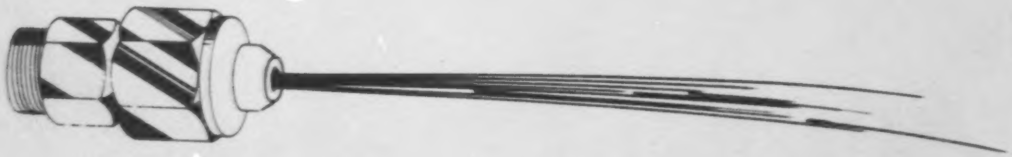
Hollow
Cone Nozzle



Flooding Flat
Fan Nozzle

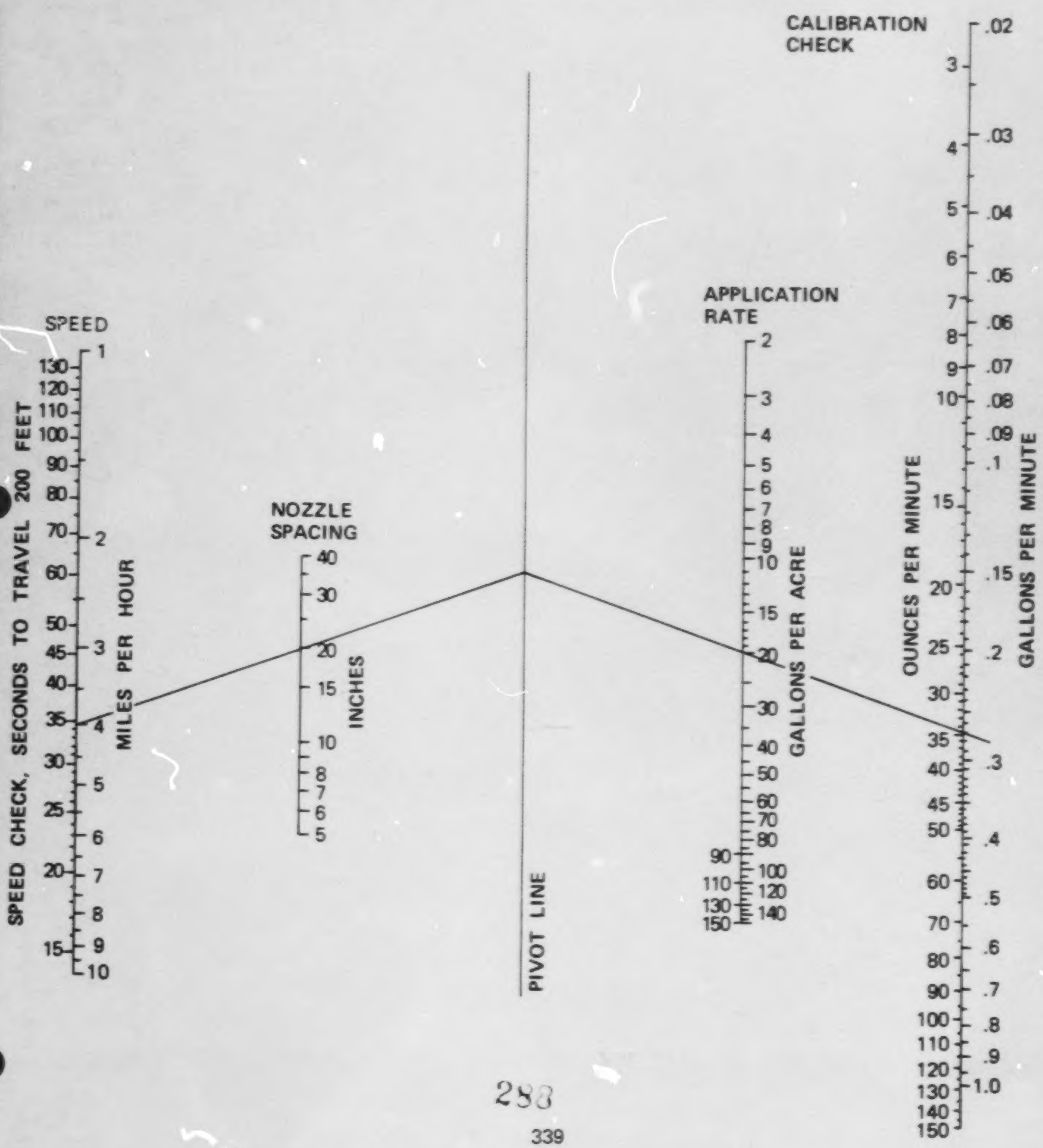


Regular Flat
Fan Nozzle



Solid Stream Nozzle

# Sprayer Calibration Nomograph



## ASSIGNMENT SHEET #1--CALCULATE PROBLEMS INVOLVING PESTICIDE EQUIPMENT CALIBRATION

Read the labels provided on the following pages. Determine the amount of pesticide to use and the type of equipment to use to make an application by answering the questions below.

1. Equipment
    a. What equipment would you use to apply De Metho?
    b. What equipment would you use to apply No-Disease?
    c. What equipment would you use to apply Anti-Weed?
2. Amounts of pesticide to use

    (NOTE: Show your work.)

    a. Your sprayer pumps 15 gallons in 5 minutes. What is the pumping rate?
    b. You have determined that at the speed and throttle setting you intend to use, your sprayer moves at 528 feet per minute. (6 mph = 528 feet per minute or 1 mph = 88 feet per minute). The sprayer boom covers a space of 15 feet wide. How many square feet does your sprayer cover in one minute?

c. One acre = 43,560 square feet. How many minutes would it take to spray one acre?

d. How much spray does your sprayer pump per acre?

e. Using the following facts, determine the pumping rate, speed sprayer travels per minute, time to cover one acre, amount of spray pumped per acre.

FACTS:
10 gallons of spray in five minutes
Spray boom width = 25 feet
Sprayer moves at 5 miles per hour
One mph = 88 feet per minute
One acre = 43,560 square feet

ANSWER:
1) Pumping rate ____________________
2) Speed sprayer travels per minute ____________________
3) Time to cover one acre ____________________
4) Amount of spray pumped per acre ____________________

### PRECAUTIONARY STATEMENTS
### HAZARDS TO HUMANS
### (DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing: Wear tightly-woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance, call 000-000-0000.

TO PHYSICIAN: De Metho is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eyes, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable! Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within
24 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposal in approved landfill or buried in a safe place.
Consult Federal, State or local Disposal authorities for approved alternate procedures.

---

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY
CERTIFIED APPLICATORS OR PERSONS UNDER THEIR
DIRECT SUPERVISION

SPECIMEN

# DE METHO

INSECTICIDE

Emulsifiable Concentrate

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL — | 24% |
| INERT INGREDIENTS: | 76% |
| TOTAL: | 100% |

**Net Content: 50 gallons**

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON
DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician imr

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minut physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and im wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL
PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

**ESTABLISHMENT NO. 1357-VT-1**
**EPA REGISTRATION NO. 1357-43**

---

### DIRECTIONS FOR USE CONTINUED

### SPRAY PREPARATION

Fill spray tank ½ to ¾ full of water. Add De Metho directly to spray tank and mix thoroughly, using mechanical or hydraulic agitation; do not use air agitation.

### APPLICATION

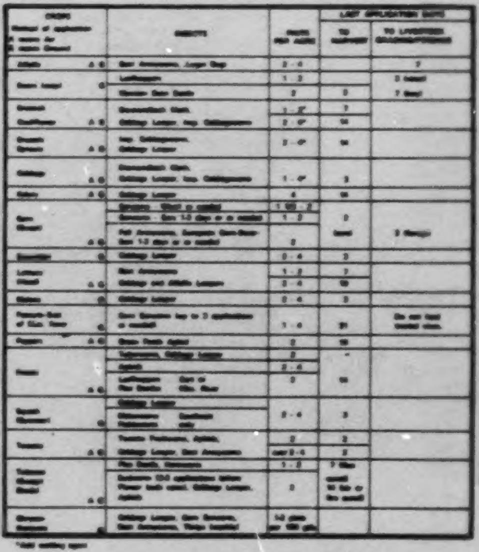
Apply at the recommended rates when insects first appear. Unless otherwise noted, repeat applications at 5- to 7-day intervals or as needed. Use sufficient water (5-15 gals per acre by air) to obtain thorough, uniform coverage. Apply the low rates on small plants, small insects and light infestations of insects. Use intermediate rates on larger insects and heavier infestations of insects. Use 1 to 3 applications of the highest recommended rate for controlling severe infestations. Thereafter, use the lowest rate possible to maintain control.

### NOTICE TO BUYER

Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of the product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

### CROP USAGE



ASSIGNMENT SHEET #1

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with

**ALMONDS:** **Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half-to-full bloom.

**APPLES, PEARS:** Apply 700 to 900 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP):** **White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH:** **Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII):** **Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES:** **Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS:** **Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 30 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL

# NO-DISEASE

## BENOMYL FUNGICIDE

**Wettable Powder**

**ACTIVE INGREDIENT**

**Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate]** 50%

**INERT INGREDIENTS** 50%

U.S. Pat. 3,541,213 & 3,631,176    EPA Est. 1352-WV-1    EPA Reg. No. 1352-394-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.

Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing. Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

## NET 50 LBS.

B-21190 B-73A    Made in U.S.A.    Printed in U.S.A.

## KILL-DEAD CHEMICALS

Chemical City, West Virginia

**PECANS:** **Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may be added to the spray to improve wetting of foliage. Apply at prepollination when young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE:** **Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. per 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thorough wetting, remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom; apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 weeks after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by Rhizopus spp. and Alternaria spp.

**STRAWBERRIES:** **Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Leaf Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue at 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acre when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals as needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII):** **Pineapple Disease (Ceratocystis paradoxa)**—Apply to cut seedpieces either as a cold dip or hot dip.

*Cold Dip*—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to give thorough wetting; remove and allow to drain.

*Hot Dip*—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of the dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES** **(Powdery Mildew, Black Spot); FLOWERS, ORNAMENTALS** **(Powdery Mildew, Botrytis Gray Mold)**: Field and Greenhouse—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, use 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-day intervals throughout the growing season; shorten interval during humid, rainy weather. Addition of a surfactant to the spray mixture enhances curative action of the fungicide, and improves distribution of the spray on hard-to-wet plants such as roses.

**BULBS** **(Easter Lily, Tulip, Gladiolus, Daffodil, Iris): Fusarium and Penicillium Rots**—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak cleaned bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hours after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bulbs have been heat-cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

ASSIGNMENT SHEET #1

# Anti-Weed

# 20G

SAMPLE LABEL

**Herbicide**

FOR WEED CONTROL
IN CORN

Active Ingredients:
Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . 20.0%

Inert Ingredients: 80.0%
Total: 100.0%

Anti-Weed 20G is a granular herbicide

**Warning:**

Keep out of reach of children. See additional warning statements on back of bag.

**50**
**Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

**KILL-DEAD**
**Chemical Company**
Chemical City, West Virginia

# ASSIGNMENT SHEET #1

**DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY**

**IMPORTANT:** Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

## Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of Kill-Dead or the Seller. All such risks shall be assumed by the Buyer.

Kill-Dead warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks referred to above. Kill-Dead **makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty.** In no case shall Kill-Dead or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. Kill-Dead and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of Kill-Dead Chemical Company.

## General Information

Anti-Weed will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since Anti-Weed acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

Anti-Weed is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using Anti-Weed where adjacent desirable trees, shrubs or plants might be injured.

Store Anti-Weed in a dry place.

### Application Instructions

Broadcast or Overall Treatment
Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment
Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \begin{matrix}\text{Recommended}\\ \text{Broadcast Rate}\end{matrix} = \begin{matrix}\text{lbs./Acre}\\ \text{Anti-Weed}\\ \text{for Band}\\ \text{Treatment}\end{matrix}$$

**Range of Rates:** In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

## Directions for Use

Anti-Weed controls most annual broadleaf and grass weeds such as:

- Giant Foxtail
- Green Foxtail
- Yellow Foxtail
- Barnyardgrass (Watergrass)
- Crabgrass
- Fall Panicum
- Annual Morningglory
- Cocklebur
- Sandbur
- Jimsonweed
- Lambsquarters
- Mustard
- Pigweed
- Ragweed
- Smartweed
- Sunflower
- Velvetleaf

Anti-Weed will not control perennial weeds such as:

Johnsongrass Field Bindweed Canada Thistle Bull Nettle

Apply Anti-Weed at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| **Soil** | **Rate per acre of** Anti-Weed **Broadcast** |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs. |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–<br>30 lbs. |

*For calculation of band treatment rate, see Application Instructions Section.

** Anti-Weed should not be used on high organic soils such as peat and muck.

**Suggestions for Crop Rotations**
1) Corn may be replanted at any time following application of Anti-Weed . 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions:** 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following Anti-Weed application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

## Warning

Keep out of reach of children.

Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.

This product is toxic to fish. Keep out of lakes, ponds and streams.

---

Do not reuse container. Destroy when empty.

## ASSIGNMENT SHEET #2–CALCULATE PROBLEMS USING NOMOGRAPH

Use the nomograph provided on the following page to calculate the problems below:

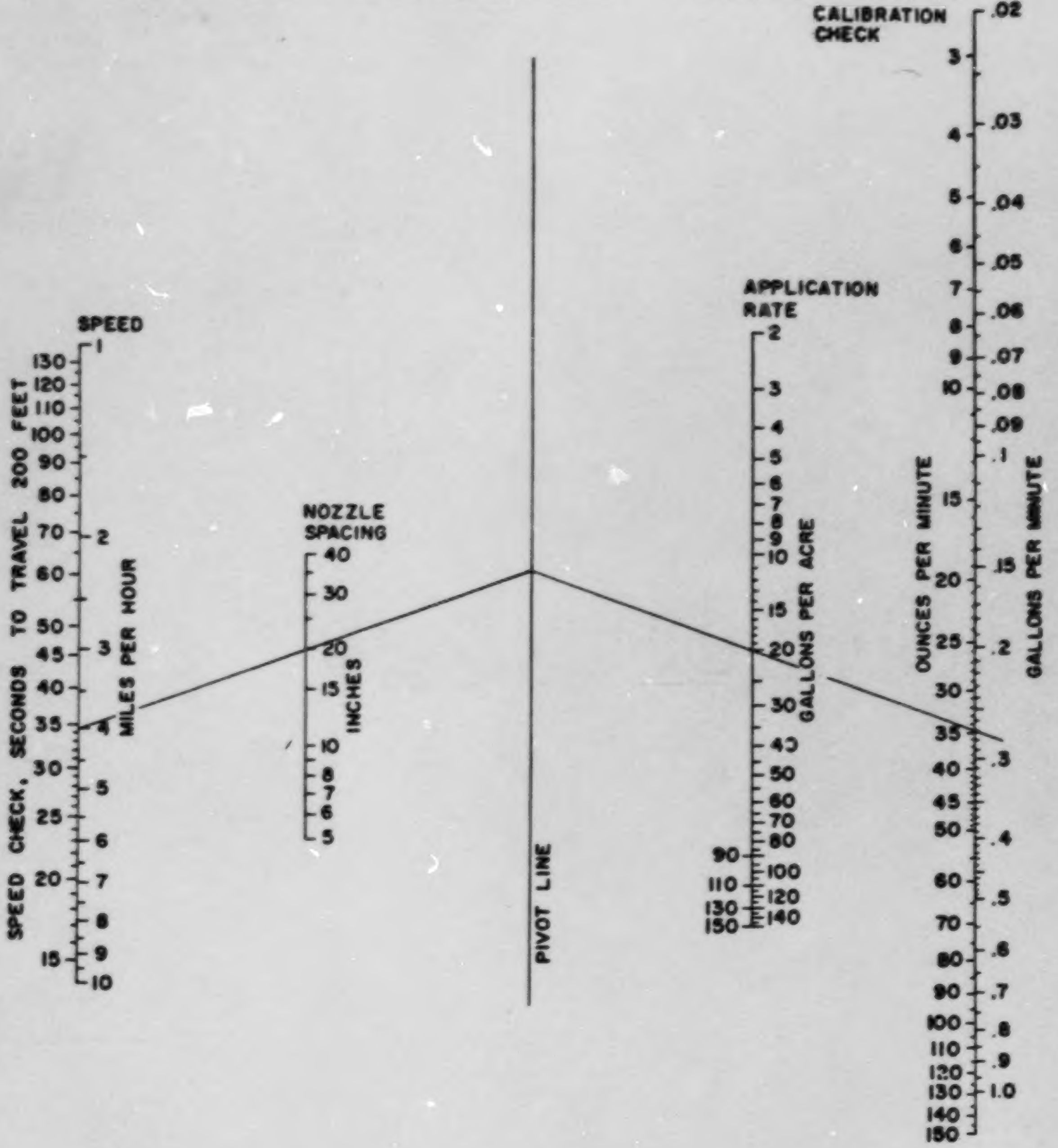
1. A broadcast sprayer has a 20 inch nozzle spacing. A check of the nozzles shows each one puts out 28 ounces per minute. How fast would you have to drive to apply 15 gallons per acre?

2. Rows are 40 inches apart. You want to spray a 14 inch band at 5 miles per hour and with an equivalent broadcast rate of 25 gallons per acre. How many ounces per minute would be applied?

3. You want to spray a broadcast rate of 25 gallons per acre at a speed of 3.5 miles per hour. The nozzles are spaced 20 inches apart on the boom. What should be the flow rate for each nozzle?

ASSIGNMENT SHEET #2

# SPRAYER CALIBRATION NOMOGRAPH


SPEED CHECK, SECONDS TO TRAVEL 200 FEET
130 120 110 100 90 80 70 60 50 45 40 35 30 25 20 15
SPEED
MILES PER HOUR
1 2 3 4 5 6 7 8 9 10
NOZZLE SPACING
INCHES
40 30 20 15 10 8 7 6 5
PIVOT LINE
APPLICATION RATE
GALLONS PER ACRE
2 3 4 5 6 7 8 9 10 15 20 30 40 50 60 70 80 90 100 110 120 130 140 150
CALIBRATION CHECK
OUNCES PER MINUTE
3 4 5 6 7 8 9 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120 130 140 150
GALLONS PER MINUTE
.02 .03 .04 .05 .06 .07 .08 .09 .1 .15 .2 .3 .4 .5 .6 .7 .8 .9 1.0

# EQUIPMENT AND ITS USE
# UNIT IX

## ANSWERS TO ASSIGNMENT SHEETS

### Assignment Sheet #1

1. Equipment

    a. Probably a low pressure field sprayer; a high pressure field sprayer might be used

    b. Probably a low pressure field sprayer; a high pressure field sprayer might be used

    c. Granular spreader

2. Amounts of pesticide to use

    a. 3 gal/min

    b. 7920 sq ft

    c. 5.5 min/acre

    d. 16.5 gal/acre

    e. 1) 2 gal/min

        2) 440 ft/min

        3) 3.96 or 4 min/acre

        4) 8 gal/acre

### Assignment Sheet #2

1. 4.3 miles per hour

2. 38 ounces per minute per nozzle

3. 0.3 gallons per minute or 38.5 ounces per minute

# EQUIPMENT AND ITS USE
## UNIT IX

## TEST

1. Match the terms on the right to the correct definitions.

_____a. Mixture of one or more active ingredients with other materials needed to make it easy to store, handle, dilute, and apply

_____b. To make a pesticide thinner or weaker by adding water, oil, or other materials

_____c. Measurement of how much pesticide will be applied by the equipment to the site; measurement of the delivery rate

_____d. Pest intended to be controlled with pesticide

_____e. Pesticide as it is sold before diluting; usually contains a large amount of the active ingredient

_____f. Able to be combined with other pesticides and applied as a mixture without reducing their effectiveness

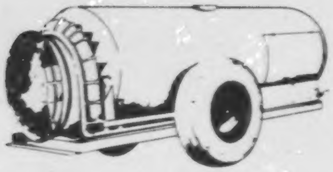
_____g. Liquid or dust used to water down or weaken a concentrated pesticide

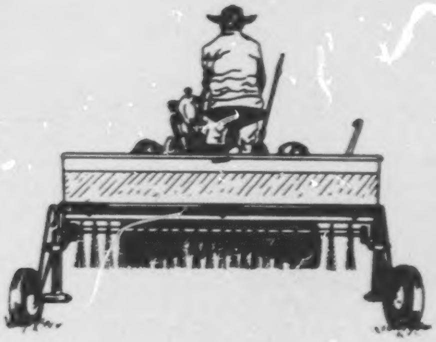
_____h. Substance added to the pesticide formulation or tank mix to make the active ingredient work better

_____i. Area, building, plant, or animal to be treated with the pesticide in order to protect it from or reach a target pest

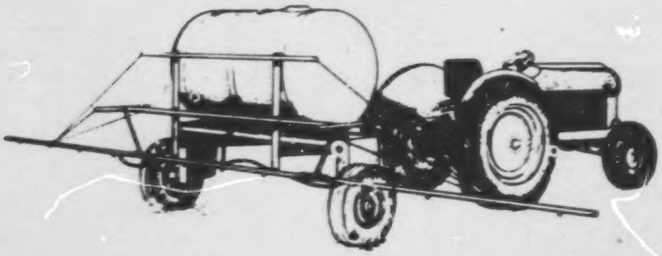
1. Dilute
2. Concentrate
3. Diluent
4. Formulation
5. Target
6. Site
7. Compatible
8. Adjuvant (additive)
9. Calibration

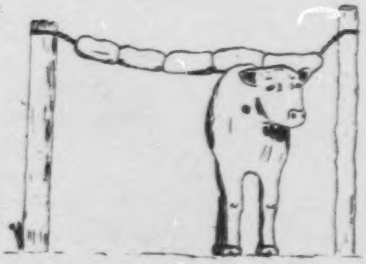
2. Identify the following types of pesticide application equipment by writing the correct names in the blanks.



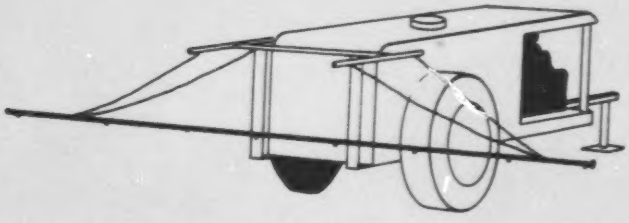


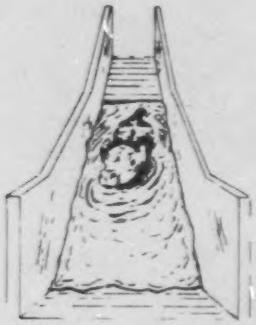
a.________________________ b.________________________





c.________________________ d.________________________





e.________________________ f.________________________

3. List three types of support equipment needed for application of pesticide.

a.

b.

c.

4. Discuss in a short paragraph the importance of choosing the proper equipment when applying pesticides.

5. Complete the following chart.

| Equipment | Advantages | Disadvantages |
|---|---|---|
| High pressure field sprayer | | |
| Low pressure field sprayer | | |
| Granular applicator | | |

6. List five safety precautions to observe when cleaning and storing equipment after use.

   a.

   b.

   c.

   d.

   e.

7. Match the types of nozzles on the right to the correct descriptions.

   ______a. Circular pattern; used for spraying foliage

   ______b. Wide flat fan pattern; used for boomless sprayers or to extend the effective width on the end of the boom

   ______c. Uniform pattern across its width; used for band spraying

   ______d. Circular pattern with little or no spray in the center; used for spraying foliage

   ______e. Wide angle spray pattern; used for broadcast spraying

   ______f. Narrow oval pattern with lighter edges; used for broadcast spraying

   ______g. Compact jet used in handguns to spray a distant target or fixed to apply a narrow band or to inject into the soil

   1. Broadcast
   2. Flooding flat fan
   3. Hollow cone
   4. Solid (full) cone
   5. Solid stream
   6. Regular flat fan
   7. Even flat fan

8. Tell why it is important to calibrate equipment.

   a.

   b.

   c.

9. Describe the procedure for calibrating pesticide application equipment by arithmetic calculation.

10. Calculate the problems below and show your work.

a. What type of equipment would you use to apply De Weed?

(NOTE: Refer to the label on the following page.)

b. Calibration

FACTS:
One acre = 43,560 square feet
One mile per hour = 88 feet per minute
Spray boom width = 20 feet
Speed sprayer travels = 5 mph
Sprayer pumps = 15 gallons in 5 minutes

1) What is the pumping rate?

2) How many feet per minute does your sprayer travel?

3) How many square feet does your sprayer cover in one minute?

4) How many minutes would it take to spray one acre?

5) How much spray do you pump per acre?

### PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (CAUTION)

Harmful if swallowed. Avoid application directly to humans. Care should be taken to avoid inhalation of dust or spray mist, or prolonged contact with skin. In case of contact, immediately flush eyes or skin with large amounts of water. Get medical attention if irritation persists. Wear safety goggles or face shield when handling.

### ENVIRONMENTAL HAZARDS

Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from target area.

### DIRECTIONS FOR USE GENERAL CLASSIFICATION

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be disposed of in an incinerator or landfill approved for pesticide containers, or buried in a safe place. Consult Federal, State, or local disposal authorities for approved alternate procedures such as limited open burning.

# DE WEED

**HERBICIDE**
**WETTABLE POWDER**

| | |
|---|---|
| ACTIVE INGREDIENT: weedout · tri-azoic acid | 80.0% |
| INERT INGREDIENTS: | 20.0% |
| TOTAL: | 100.0% |

## KEEP OUT OF REACH OF CHILDREN

## CAUTION

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED Induce vomiting
IF INHALED Remove to fresh air
IF IN EYES Flush eyes with plenty of water
IF ON SKIN Remove clothing and wash with detergent and water

MFG BY A-Z CHEMICALS
Aster, Minnesota

EPA ESTABLISHMENT NO. 1357-MN-1
EPA REGISTRATION NO. 1357-41

### DIRECTIONS FOR USE CONTINUED

DeWeed is for weed control in certain crops, ornamental plantings, on industrial sites, and around-the-farm. It should be applied before weeds emerge or following removal of weed growth. It controls a wide variety of annual broadleaf and grass weeds when used at selective rates in agricultural crops and ornamental plantings. When used at higher, non-selective rates in non crop areas, it also controls many perennial broadleaf and grass weeds.

**GROUND APPLICATION:** Use conventional spray equipment with 80° flat-fan nozzles. Screens in spray system should be no finer than 50 mesh. Use a pump with capacity to maintain 35-40 psi at nozzles. Use hydraulic or mechanical agitation during mixing and application to maintain a uniform suspension. Aerial application: Use only where specified in the use directions.

**BLUEBERRIES and CANEBERRIES** (blackberries, boysenberries, loganberries, raspberries)—Quackgrass. Apply 5 lbs per acre in the fall or split the application applying 2½ lbs per acre in the fall plus 2½ lbs per acre in the spring, when quackgrass is growing. Do not apply when fruit is present.

**ALFALFA**—Pure alfalfa less than one year old (Northeastern U.S. only)—Henbit, wild mustard, chickweed, alyssum, downy brome, wild oats, and pigweed. Pure alfalfa which has been seeded in the spring (before June 1) may be treated in the fall after the last cutting but before frozen ground conditions. Apply 1 lb. of De Weed per acre. For ground application apply in a minimum of 2½ gals. of water per acre.

**GRASSES GROWN FOR SEED** (Pacific Northwest only). Perennial ryegrass, tall fescue and fine fescues, such as Penntown, Chewings, Ronor, and related species. Control of broadleaf weeds and annual grasses including annual ryegrass, rattail fescue, silver hairgrass and downy brome. Apply 2½ lbs of De Weed in a minimum of 15 gals of water per acre as soon as fall rains start. Apply only to grasses from which at least one seed crop has been cut.

**WEED CONTROL** on industrial sites, highway medians, and shoulders, railroad rights-of-way, lumber yards, and in non-crop areas on farms such as around buildings, fuel storage areas, along fences, roadsides, and lanes. Aerial application may be made where it is feasible. Use at least 1 gal of water for each 1 lb. of De Weed: use more water if practical for both ground and aerial application. To control annual broadleaf and grass weeds (including barnyard grass, cheat, crabgrass, lambsquarters, foxtail, ragweed, puncturevine and mullein), apply 6-12½ lbs. per acre. To control most annual and many perennial broadleaf and grass weeds (including quackgrass, bluegrass, redtop, burdock, Canada thistle, orchardgrass, dogfennel, and plantain), apply 12½-25 lbs. per acre. To control hard-to-kill perennial weeds (including bull thistle and sow thistle), apply 25-50 lbs. per acre.

NET WEIGHT FIVE POUNDS

# EQUIPMENT AND ITS USE
## UNIT IX

## ANSWERS TO TEST

1.
   a. 4
   b. 1
   c. 9
   d. 5
   e. 2
   f. 7
   g. 3
   h. 8
   i. 6

2.
   a. Air blast sprayer or mist blower
   b. Granular applicator
   c. Low pressure field sprayer
   d. Back rubber
   e. High pressure field sprayer
   f. Dipping vat

3. Any three of the following:
   a. Filler pump
   b. Tank truck
   c. Nurse or mixing tank
   d. Front-end loader
   e. Tractor

4. Discussion should include:
   a. Saves time
   b. Saves money
   c. Provides more thorough application
   d. Applies pesticides correctly

5.

| Equipment | Advantages | Disadvantages |
|---|---|---|
| High pressure field sprayer | Well-built; long life; usually has mechanical agitation; very versatile | Expensive; requires large amounts of water, power, and fuel; heavy tire loads; drift hazard |
| Low pressure field sprayer | Low cost; lightweight; versatile; covers large areas rapidly | Low volume output limits pesticide penetration; agitation is limited |
| Granular applicator | Lightweight; no water needed; often used in fertilizer spreader or seeder | High cost of pesticide; limited foliar use; must calibrate for each size of granule |

6. Any five of the following:

   a. Wear protective clothing and equipment as called for on the label

   b. Follow ALL safety precautions stated on the label

   c. Check equipment for leaks

   d. Use all of the pesticide mix in the sprayer

   e. Wash equipment before storing

   f. Release pressure

   g. Wash out tank and flush nozzles with clean water; dispose of residue properly

7. a. 4 e. 2

   b. 1 f. 6

   c. 7 g. 5

   d. 3

8. a. Obtain desired control

   b. Practice good economics

   c. Apply proper dosage of the pesticide

9. Description should include:

   a. Determine pumping rate

      1) Fill spray tank completely full of water

      2) Put vehicle in neutral at the throttle setting (rpm) desired

      3) Open the spray valve and pump for a predetermined time

      4) Close valve, shut down the equipment, and measure the amount of water needed to refill the tank

      5) Divide the number of gallons by time to get pumping rate

   b. Determine gallons per acre

      1) Determine the number of feet the sprayer moves in one minute at the desired speed and throttle

      2) Measure the width of the sprayer boom

      3) Determine the pumping rate

      4) Figure the area that the sprayer covered in one minute (distance traveled x boom width)

      5) Figure how many minutes it would take to spray one acre (divide 43,560 by the area covered in one minute)

      6) Figure the amount of spray pumped per acre (pumping rate x number of minutes per acre)

10. a. Low pressure field sprayer

   b. 1) 3 gallons per minute

      2) 440 feet per minute

      3) 8800 square feet per minute

      4) 5 minutes

      5) 15 gallons per acre

# DISPOSAL AND STORAGE
## UNIT X

## TERMINAL OBJECTIVE

After completion of this unit, the student should be able to discuss proper methods for disposing of surplus pesticides and pesticide containers. The student should be able to name safety considerations when disposing and storing pesticides and pesticide containers, name steps to follow when rinsing pesticide containers, and interpret labels. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

## SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with disposal and storage to the correct definitions.
2. Name the classifications for disposal of empty pesticide containers.
3. Name steps to follow when rinsing pesticide containers.
4. Name methods for disposal of pesticides and pesticide containers.
5. Discuss in a short paragraph the proper method for disposing of surplus pesticides.
6. Name safety considerations when disposing of pesticides and pesticide containers.
7. Name requirements of a storage area.
8. Discuss in a short paragraph factors to consider in selecting a storage area.
9. Discuss in a short paragraph procedures for handling damaged containers in the storage area.
10. Name factors to consider when arranging pesticide containers within the storage area.
11. Name the reason for storing herbicides separately.
12. Interpret labels correctly by answering questions related to disposal and storage.

# DISPOSAL AND STORAGE
## UNIT X

## SUGGESTED ACTIVITIES

I. Instructor:

- A. Provide student with objective sheet.
- B. Provide student with information and assignment sheets.
- C. Discuss terminal and specific objectives.
- D. Make transparencies.
- E. Discuss information and assignment sheets.
- F. Take field trip to see a good storage area. Inspect the school's pesticide storage area. What improvements could be made?
- G. Secure resource person to come to class and talk about qualifications of disposal of pesticides and/or pesticide containers at local landfill.
- H. Ask a local firechief to talk to class about pesticide fire hazards and precautions.
- I. Ask students to plan a good storage area or critique pictures of other storage areas.
- J. Give test.

II. Student:

- A. Read objective sheet.
- B. Study information sheet.
- C. Complete assignment sheet.
- D. Go on field trip to see a storage area.
- E. Take test.

## INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency masters

   A. TM 1--Container Classification

   B. TM 2--Rinsing Drums

   C. TM 3--Disposal of Containers

   D. TM 4--Storage Area

IV. Assignment Sheet #1--Interpret Labels

V. Answers to assignment sheet

VI. Test

VII. Answers to test

# DISPOSAL AND STORAGE
# UNIT X

## INFORMATION SHEET

I. Terms and definitions

A. Disposal--Act or process of correctly discarding pesticides and pesticide containers; can include recycling, deposit-return, reuse, or burning

B. Downwind--Side towards which the prevailing wind is blowing

C. Encapsulation--Method of disposal of pesticides and pesticide containers by sealing them in sturdy, waterproof, chemical-proof container which is then sealed in thick plastic, steel, or concrete to resist damage or breakage

(NOTE: The whole package is then usually buried in an area where water could not be contaminated even if leakage occurs.)

D. Herbicide--Pesticide that is used to control unwanted plants

E. Incinerator--Special high-heat furnace or burner which reduces everything to nontoxic ash and gas

F. Soil injection--Method of disposal of pesticides by putting them within the plow layer of soil by usual tillage practices

G. Monitoring system--Regular system of keeping track of and checking up on whether or not pesticides are escaping into the environment

H. Original container--Package (bag, can, or bottle) in which a pesticide is sold

(NOTE: The package must have a label telling what the pesticide is, how to use it correctly and safely, and how to safely dispose of the empty container.)

I. Pollute--To make unclean or unsafe

J. Diluent--Liquid, such as water, kerosene, alcohol, or dust, which "waters down" or weakens a concentrated pesticide

K. Contaminate--Pollute or make unfit for use

L. Sensitive--Easily injured

# INFORMATION SHEET

II. Classifications for disposal of empty pesticide containers (Transparency 1)

   A. Burnable containers

      (NOTE: Small quantities, usually the amount emptied in one day, of paper and cardboard pesticide containers may be burned if local laws allow burning in your area.)

      (CAUTION: Before burning check local, state, and federal regulations.)

   B. Nonburnable containers

      (NOTE: These are usually metal, glass, or plastic containers.)

   C. Containers with mercury, lead, cadmium, arsenic, or inorganic pesticides

      (NOTE: These containers may be cardboard, paper, metal, plastic, or glass and should be handled differently from other pesticide containers. They are special because the type of pesticide they contain is very persistent in and hazardous to the environment.)

III. Rinsing pesticide containers (Transparency 2)

   A. Empty the container into the tank and let it drain 30 seconds

   B. Fill it one-fifth to one-fourth full of water or other diluent

      (NOTE: Sometimes diluents such as Kerosene and other petroleum solvents are used in the tank mix. Rinse the container and measuring cup with the diluent used in the tank mix.)

   C. Replace cap and rotate container to rinse all sides

   D. Drain rinse from container into tank and let drain for 30 seconds

   E. Repeat rinse and drain a total of three (3) times

IV. Methods for disposal of pesticides and pesticide containers (Transparency 3)

   A. Open burning

      (NOTE: Check local regulations. In some areas burnable containers may be burned on the farm in small quantities, usually the amount emptied in one day. Never burn containers which held 2,4-D type herbicides because the smoke could injure sensitive plants.)

   B. Burial

      (NOTE: Many landfills will accept triple-rinsed pesticide containers, especially if broken, crushed, or cut apart. Otherwise, the burial site should be selected in an area where water will not be contaminated and where public health and the environment will not be harmed. Do not bury pesticides and unrinsed pesticide containers that contain mercury, lead, cadmium, arsenic, or inorganic pesticides unless they are encapsulated. Some landfills will take these containers if they have been triple rinsed.)

C. Recycling

(NOTE: Some nonburnable containers, such as plastic and steel drums, may be returned to the manufacturer for reuse.)

D. Incineration in a special pesticide-approved incinerator

(NOTE: Some pesticides and pesticide containers may be made harmless using this method. However, this method may not be used for pesticides or pesticide containers with mercury, lead, cadmium, arsenic, or inorganic pesticides.)

E. Chemical degradation

(NOTE: Sometimes pesticides can be chemically broken down into nontoxic materials. These methods are specific for each chemical and cannot be described here. Check with the manufacturer or local Environmental Protection Agency officials for specific methods.)

F. Soil injection

(NOTE: Use soil injection methods only when recommended by state or federal regulatory officials.)

G. Encapsulation

(NOTE: This is usually the only method of disposal of pesticides or unrinsed containers with mercury, lead, cadmium, arsenic, or inorganic pesticides.)

V. Disposing of surplus pesticides

A. Try to find other areas with the same problem and use up any extra tank mix, if you mix too much pesticide for a job

B. Return unused pesticides to manufacturer

(NOTE: Check with the company and see if it will take the pesticide back. If, for some reason, it will not take the pesticide back, return the pesticide to your storage area or dispose of it safely by incineration or by encapsulation and burial.)

C. Use one of the other disposal methods listed after consulting an expert

VI. Safety considerations when disposing of pesticides and pesticide containers

A. Location of sensitive areas, especially streams, ponds, and other water supplies

B. Personal safety

C. Environmental safety

VII. Requirements of storage area (Transparency 4)

  A. Child-proof

  B. Cool, dry, well-ventilated room or building

  C. Fire-resistant

  D. Fenced in or at least able to be locked

  E. Warning signs posted on doors and windows

  (NOTE: Warning signs should read: Danger! Pesticides! Keep Out!)

  F. Supplied with detergent, hand cleaner, and water

  G. Supplied with absorbent materials, such as sand, sawdust, and paper

  (NOTE: These materials can be used to soak up spills.)

  H. Supplied with shovel, broom, dust pan, and fire extinguisher

VIII. Selecting the storage area

  A. Where water supply will not be contaminated even if there is an accident or fire

  B. Free from flooding

  C. Downwind and downhill from sensitive area

  D. No problem with runoff or drainage

IX. Handling damaged containers in storage area

  A. Check containers often for leaks, corrosion, and loose caps

  (NOTE: Clean up any leaks right away.)

  B. Store pesticides in original containers

  (NOTE: This statement holds true unless the original container breaks, leaks, or corrodes.)

  C. Label any substitute containers with the entire label

  (NOTE: Unlabeled pesticides are worthless since you don't know what they are or how to use them. They should be treated as surplus pesticides and held for disposal.)

  D. Keep partly empty pesticide containers tightly closed

  E. Wear protective clothing and equipment

## INFORMATION SHEET

X. Arranging pesticide containers within storage area

   A. Separate similar containers to avoid the chance of a mistake

   B. Store containers with label in plain sight

   C. Store on shelves off the floor

   D. Keep containers in upright position to prevent spills

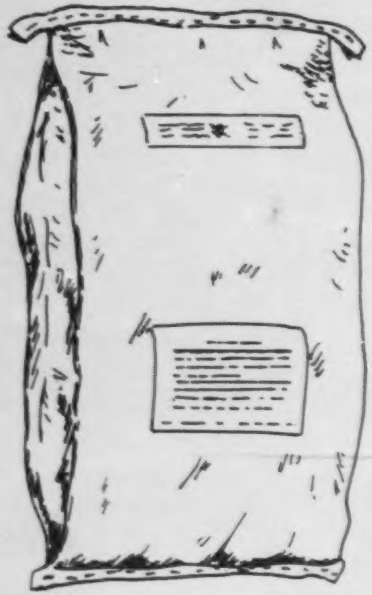
   E. Place containers in orderly rows

XI. Reason for storing herbicides separately--Some herbicides, such as 2,4-D, can vaporize (become a gas) and get into other pesticides nearby

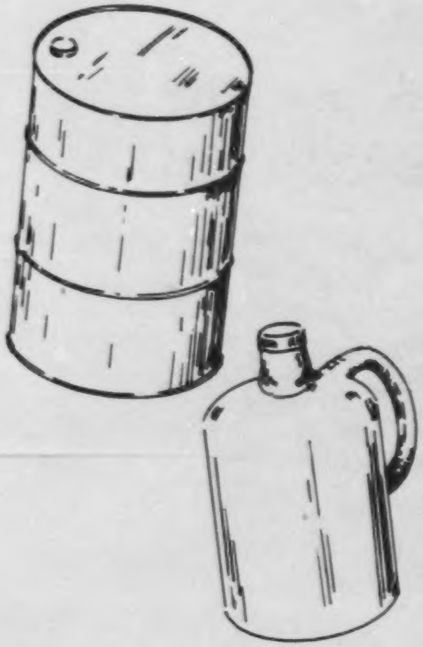
(NOTE: Your storage area needs to be divided with a special area for storing herbicides. All highly toxic pesticides should be stored together.)

# Container Classification

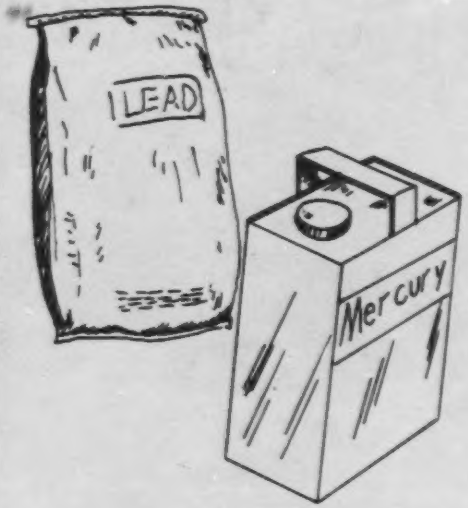
**Burnable**



**Nonburnable**



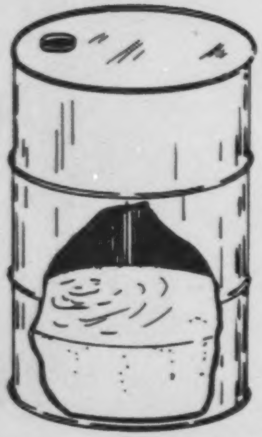
**Mercury, Lead, Arsenic Cadmium and Inorganic Pesticides**



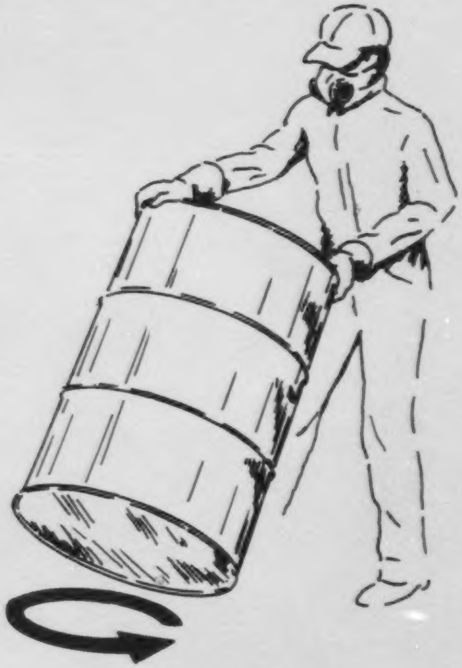
TM 1

# Rinsing Drums

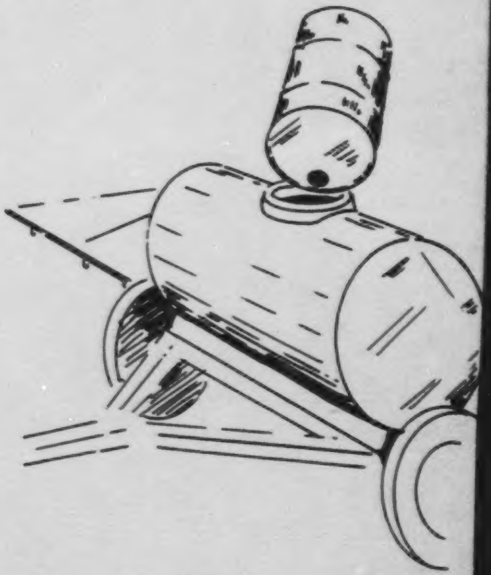
## Rinse and Drain - Three Separate Times



**Fill 50 Gallon Drum ¼ Full**



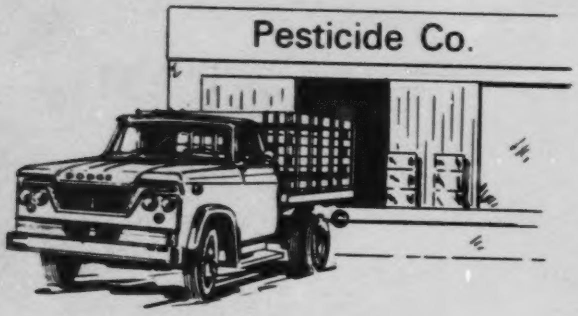
**Rotate With Lip on Ground**



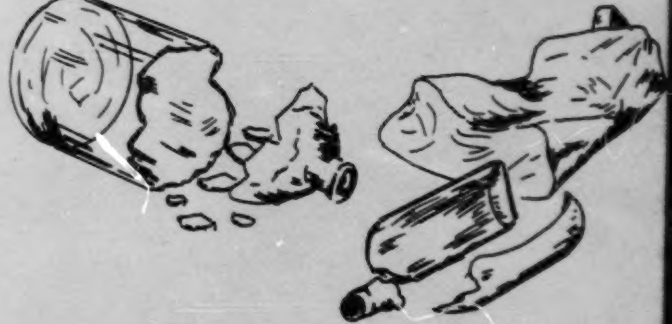
**Drain Into Spray Tank**

# Disposal of Containers

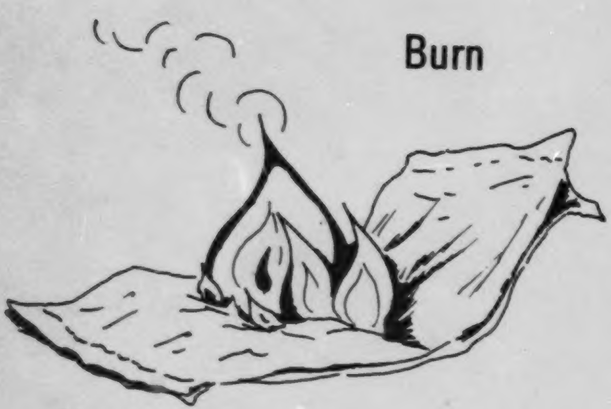
Recycling


Pesticide Co.

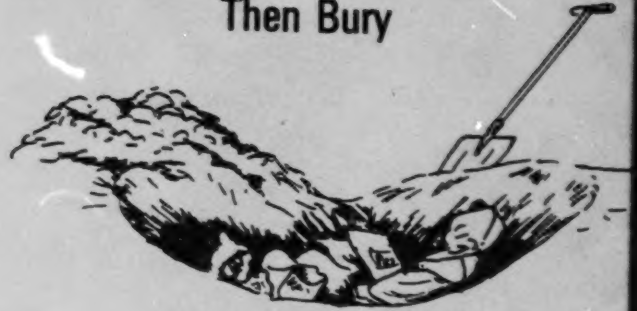
Break, Crush, or Cut Apart



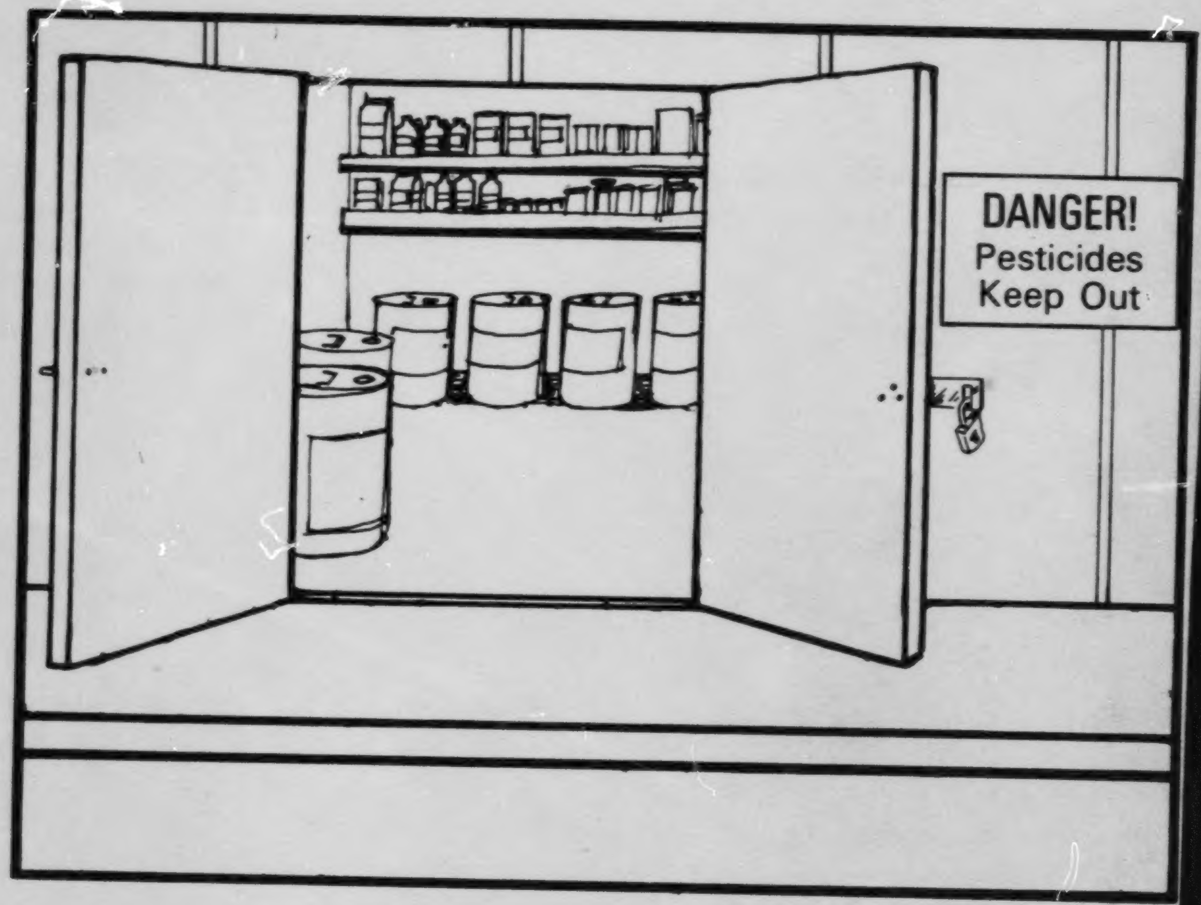
Burn



Then Bury



# Storage Area


DANGER!
Pesticides
Keep Out

# DISPOSAL AND STORAGE
# UNIT X

## ASSIGNMENT SHEET #1--INTERPRET LABELS

The purpose of this assignment is to allow you to locate important information that must be contained on all pesticide labels. Read each of the labels on the following pages and answer the questions below pertaining to the specific label. When completed return to instructor for evaluation.

1. 2,4-D label
    a. This granular pesticide is sold in a 50 lb paper bag. How would you dispose of it?
    b. What special storage and transportation precautions would you take?
2. De Metho label
    a. What classification is this plastic bottle container?
    b. How do you dispose of this container?
    c. How should you store this container?
    d. If you mixed too much spray for your alfalfa field (4 pints/acre rate), name two other crops on which you could use the extra spray. This would have to apply only if they had not recently been sprayed and had an insect infestation.
3. No-Disease label
    a. How would you store this pesticide?
    b. What special storage precautions must you take?

c. What classification is this paper bag container?

d. How would you dispose of this container?

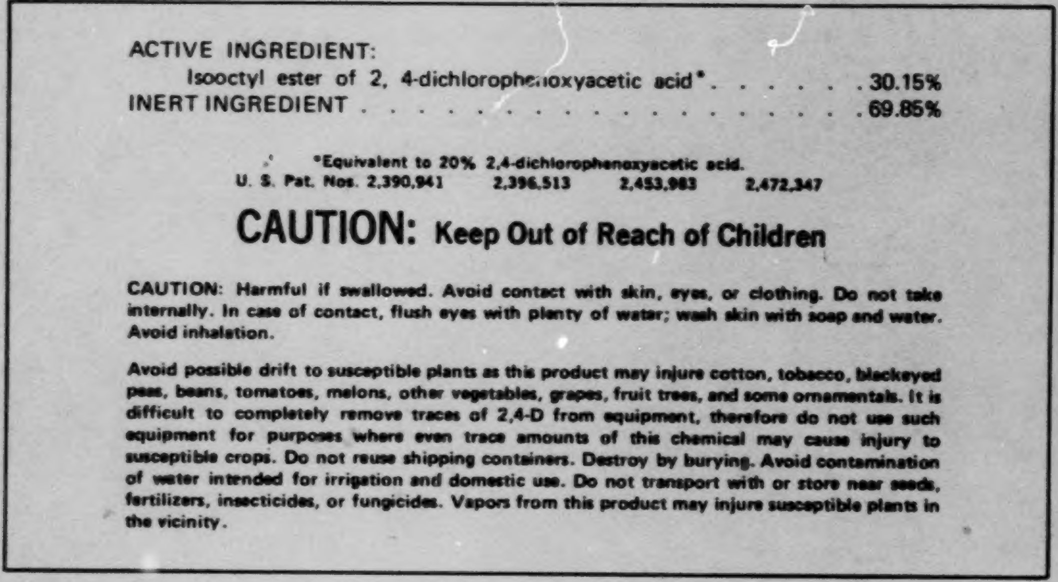
4. Anti-Weed

a. How would you store this pesticide?

b. What classification is this paper bag container?

c. How would you dispose of this container?

1. A portion of a 2,4-D label



ACTIVE INGREDIENT:
Isooctyl ester of 2, 4-dichlorophenoxyacetic acid* . . . . . . . 30.15%
INERT INGREDIENT . . . . . . . . . . . . . . . . . . . . 69.85%

*Equivalent to 20% 2,4-dichlorophenoxyacetic acid.
U. S. Pat. Nos. 2,390,941 2,396,513 2,453,983 2,472,347

**CAUTION: Keep Out of Reach of Children**

CAUTION: Harmful if swallowed. Avoid contact with skin, eyes, or clothing. Do not take internally. In case of contact, flush eyes with plenty of water; wash skin with soap and water. Avoid inhalation.

Avoid possible drift to susceptible plants as this product may injure cotton, tobacco, blackeyed peas, beans, tomatoes, melons, other vegetables, grapes, fruit trees, and some ornamentals. It is difficult to completely remove traces of 2,4-D from equipment, therefore do not use such equipment for purposes where even trace amounts of this chemical may cause injury to susceptible crops. Do not reuse shipping containers. Destroy by burying. Avoid contamination of water intended for irrigation and domestic use. Do not transport with or store near seeds, fertilizers, insecticides, or fungicides. Vapors from this product may injure susceptible plants in the vicinity.

### PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Use only when wearing the following protective equipment and clothing. Wear tightly-woven cotton overalls, waterproof hat, unlined neoprene gloves and boots. Wear safety goggles and/or face shield. Wear a mask or respirator jointly approved by the Mining Enforcement and Safety Administration and by the National Institute for Occupational Safety and Health. Before removing gloves, wash them with detergent and water. Always wash hands, face and arms with detergent and water before smoking, eating or drinking. For emergency assistance, call 000-000-0000.

TO PHYSICIAN: De Metho is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2 mg. intravenously or subcutaneously. If in eyes, instill one drop of Homatropine. Close supervision of the patient is indicated for at least 48 hours.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment or disposal of wastes.

### PHYSICAL OR CHEMICAL HAZARDS

Flammable! Keep away from heat and open flame.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

### RE-ENTRY STATEMENT (IF APPLICABLE)

Do not enter area within 24 hours after application.

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. DISPOSAL—Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be triple rinsed and offered for recycling, reconditioning, or disposed in approved landfill or buried in a safe place.

Consult Federal, State or local Disposal authorities for approved alternate procedures.

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

# DE METHO

**INSECTICIDE**

**Emulsifiable Concentrate**

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL | 24% |
| INERT INGREDIENTS: | 76% |
| TOTAL: | 100% |

**Net Content: 50 gallons**

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

SPECIMEN

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician immediately.

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

**ESTABLISHMENT NO. 1357-VT-1**
**EPA REGISTRATION NO. 1357-43**

### DIRECTIONS FOR USE CONTINUED

### SPRAY PREPARATION

Fill spray tank ½ to ⅔ full of water. Add De Metho directly to spray tank and mix thoroughly, using mechanical or hydraulic means; do not use air agitation.

### APPLICATION

[illegible]

### NOTICE TO BUYER

Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller. Buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

### CROP USAGE

| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

[illegible]

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with

**ALMONDS:** **Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half-to-full bloom.

**APPLES, PEARS:** Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to deactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP):** **White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH:** **Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII):** **Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES:** **Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS:** **Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 25 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL.

# NO-DISEASE

## BENOMYL FUNGICIDE

**Wettable Powder**

|  |  |
|---|---|
| **ACTIVE INGREDIENT**<br>Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate] | 50% |
| **INERT INGREDIENTS** | 50% |

U.S. Pats. 3,541,213 & 3,631,176 EPA Est. 1352-WV-1 EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.
Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing.
Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

**NET 50 LBS.**

B-21150 B-73A Made in U.S.A. Printed in U.S.A.

**KILL-DEAD CHEMICALS**
Chemical City, West Virginia

**PECANS:** **Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Appl ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may b added to the spray to improve wetting of foliage. Apply at prepollination whe young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE:** **Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. pe 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thoroug wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per acr with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 week after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by Rhizopus spp. and Alternaria spp.

**STRAWBERRIES:** **Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Lea Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue a 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acr when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals a needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII):** **Pineapple Disease (Ceratocystis paradoxa)**—Appl to cut seedpieces either as a cold dip or hot dip:

Cold Dip—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to giv thorough wetting; remove and allow to drain.

Hot Dip—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of th dip at 50°C. Soak seedpieces for 20 to 30 minutes; remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES** (**Powdery Mildew, Black Spot**); **FLOWERS, ORNAMENTALS** (**Powdery Mildew, Botrytis Gray Mold**): Field and Greenhouse—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, us 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-da intervals throughout the growing season; shorten interval during humid, rainy weather Addition of a surfactant to the spray mixture enhances curative action of the fung cide, and improves distribution of the spray on hard-to-wet plants such as roses

**BULBS** (**Easter Lily, Tulip, Gladiolus, Daffodil, Iris**): **Fusarium and Penicilliu Rots**—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak clean bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hour after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bul have been heat-cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to th chemical description on the label thereof and is reasonably fit for purposes state on such label only when used in accordance with directions under normal use con ditions. This warranty does not extend to use of this product contrary to label directions, or under abnormal use conditions, or under conditions not reasonab foreseeable to seller; buyer assumes all risk of any such use. Seller makes no oth warranties, express or implied.

Purchase of this material does not confer any rights under patents of countri outside of the United States.

# Anti-Weed

# 20G

## SAMPLE LABEL

## Herbicide

FOR WEED CONTROL
IN CORN

Active Ingredients:
Atrazine: 2-chloro-4-Ethylamino-6-isopropylamino-s-triazine . . . 20.0%

| | |
|---|---|
| Inert Ingredients: | 80.0% |
| Total: | 100.0% |

Anti-Weed 20G is a granular herbicide

**Warning:**

Keep out of reach of children. See additional warning statements on back of bag.

**50**
**Pounds**
NET WEIGHT

EPA Est. No. 1352-WV-1
EPA Reg. No. 1352-519

**KILL-DEAD**
Chemical Company
Chemical City, West Virginia

# ASSIGNMENT SHEET #1

## DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

**IMPORTANT:** Read the entire **Directions For Use** and the **Conditions Of Sale And Warranty** before using this product.

### Conditions Of Sale And Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of **Kill-Dead** or the Seller. All such risks shall be assumed by the Buyer.

**Kill-Dead** warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use,** subject to the inherent risks referred to above. **Kill-Dead makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty.** In no case shall **Kill-Dead** or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. **Kill-Dead** and the Seller offer this product and the Buyer and user accept it, subject to the foregoing **Conditions Of Sale And Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of **Kill-Dead Chemical Company.**

### General Information

**Anti-Weed** will control most annual broadleaf and grass weeds in field corn, silage corn and sweet corn. It should be applied prior to weed and crop emergence.

Since **Anti-Weed** acts mainly through root absorption, its effectiveness depends on rainfall or irrigation to move it into the root zone. Best results are obtained when moisture occurs within 10 days after application. Should moisture not occur within this period or should weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control.

**Anti-Weed** is noncorrosive to equipment and metal surfaces, nonflammable and has low electrical conductivity.

Care should be taken to avoid using **Anti-Weed** where adjacent desirable trees, shrubs or plants might be injured.

Store **Anti-Weed** in a dry place.

**Application Instructions**
Broadcast or Overall Treatment
Use broadcast applicators or fertilizer spreaders that can apply small amounts of granules evenly.

Band Treatment
Use applicators designed for this purpose. Calculate the amount of granules per acre needed for band treatment as follows:

$$\frac{\text{Band Width in Inches}}{\text{Inches Between Crop Rows}} \times \begin{array}{l}\text{Recommended}\\ \text{Broadcast Rate}\end{array} = \begin{array}{l}\text{lbs./Acre}\\ \text{Anti-Weed}\\ \text{for Band}\\ \text{Treatment}\end{array}$$

**Range of Rates:** In each case where a range of rates is given, the lower rate should be used on soils low in organic matter and the higher rate should be used on soils high in organic matter.

### Directions for Use

**Anti-Weed** controls most annual broadleaf and grass weeds such as:

Giant Foxtail
Green Foxtail
Yellow Foxtail
Barnyardgrass
(Watergrass)
Crabgrass

Fall Panicum
Annual Morningglory
Cocklebur
Sandbur
Jimsonweed
Lambsquarters

Mustard
Pigweed
Ragweed
Smartweed
Sunflower
Velvetleaf

**Anti-Weed** will not control perennial weeds such as:

Johnsongrass
Field Bindweed
Canada Thistle
Bull Nettle

Apply **Anti-Weed** at planting behind the press wheel or immediately after planting prior to emergence of either crop or weeds. See table below for recommended rates.

| **Soil** | **Rate per acre of Anti-Weed Broadcast** |
|---|---|
| Light soils: Sands, loamy sands, and sandy loams | 15 lbs. |
| Medium to heavy soils including the dark prairie soils in the Corn Belt** | 22.5–<br>30 lbs. |

*For calculation of band treatment rate, see Application Instructions Section.

** Anti-Weed should not be used on high organic soils such as peat and muck.

**Suggestions for Crop Rotations**
1) Corn may be replanted at any time following application of Anti-Weed. 2) Sorghum may be seeded in all areas the spring following application of the granules. 3) Soybeans may be seeded in Louisiana, Arkansas, Missouri, Iowa and Southeastern Minnesota and areas east of these states the spring following applications made not later than June 1 of the previous year.

**Precautions:** 1) Do not plant sugar beets, tobacco, vegetables (including dry beans), spring-seeded small grains or small-seeded legumes and grasses the year following Anti-Weed application or injury may occur. 2) Following harvest of a treated crop, plow (moldboard or disk-plow) and thoroughly till the soil in the fall or spring to minimize possible injury to rotational spring-seeded crops. 3) Injury to rotational crops following application may occur on eroded hillsides, alkali outcroppings, gravelly areas and on soils in general with pH near or exceeding 7.5. 4) Do not graze treated area or feed treated forage to livestock for 21 days following application.

### Warning

**Keep out of reach of children.**

**Irritating to skin, eyes, nose and throat. May be harmful if swallowed. May cause allergic skin reaction. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. While handling, wear rubber gloves. In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention. Launder clothing before reuse. Avoid contamination of seed, feed and foodstuffs.**

**This product is toxic to fish. Keep out of lakes, ponds and streams.**

**Do not reuse container. Destroy when empty.**

326

## DISPOSAL AND STORAGE
## UNIT X

### ANSWERS TO ASSIGNMENT SHEET

1. 2,4-D label
   a. Burying--Burning bags containing even small amounts of 2,4-D could cause phytotoxicity from smoke which is carrying the 2,4-D vapor
   b. Do not transport or store near seeds, fertilizers, insecticides, or fungicides. Vapors from this product may injure susceptible plants in the vicinity. Do not store near or with food stuffs
2. Deetho label
   a. Nonburnable
   b. Triple rinse, crush, and bury in a safe place or in a local landfill, if legal
   c. In original container in a dry, locked pesticide storage area away from food, feed, and livestock
   d. Cauliflower, brussels sprouts, cabbage, celery, cucumber, head lettuce, melons, peanuts, potatoes, summer squash, or tomato
3. No-Disease label
   a. In original container in a dry, locked pesticide storage area away from food, feed, and livestock
   b. Do not allow this pesticide to become wet during storage
   c. Nonburnable
   d. Crush and bury
4. Anti-Weed label
   a. In original container in a dry, locked pesticide storage area away from food, feed, and livestock
   b. Burnable
   c. Burn

# DISPOSAL AND STORAGE
# UNIT X

## TEST

1. Match the terms on the right to the correct definitions on the left. Place the appropriate numbers in the blanks provided.

_____a. Easily injured

_____b. Act or process of correctly discarding pesticides and pesticide containers; can include recycling, deposit-return, reuse, or burning

_____c. Pollute or make unfit for use

_____d. Side towards which the prevailing wind is blowing

_____e. Liquid, such as water, kerosene, alcohol, or dust, which "waters down" or weakens a concentrated pesticide

_____f. Method of disposal of pesticides and pesticide containers by sealing them in sturdy, waterproof, chemical-proof container which is then sealed in thick plastic, steel, or concrete to resist damage or breakage

_____g. To make unclean or unsafe

_____h. Pesticide that is used to control unwanted plants

_____i. Package (bag, can, or bottle) in which a pesticide is sold

_____j. Special high-heat furnace or burner which reduces everything to nontoxic ash and gas

_____k. Regular system of keeping track of and checking up on whether or not pesticides are escaping into the environment

_____l. Method of disposal of pesticides by putting them within the plow layer of soil by usual tillage practices

1. Soil injection
2. Monitoring system
3. Original container
4. Pollute
5. Diluent
6. Contaminate
7. Sensitive
8. Disposal
9. Downwind
10. Encapsulation
11. Herbicide
12. Incinerator

2. Name the classifications for disposal of empty pesticide containers.

   a.

   b.

   c.

3. Name steps to follow when rinsing pesticide containers.

   a.

   b.

   c.

   d.

   e.

4. Name three methods for disposal of pesticides and pesticide containers.

   a.

   b.

   c.

5. Discuss in a short paragraph the proper method for disposing of surplus pesticides.

6. Name safety considerations when disposing of pesticides and pesticide containers.

   a.

   b.

   c.

7. Name five requirements of a storage area.

   a.

   b.

   c.

   d.

   e.

8. Discuss in a short paragraph factors to consider in selecting a storage area.

9. Discuss in a short paragraph procedures for handling damaged containers in the storage area.

10. Name factors to consider when arranging pesticide containers within the storage area.

    a.

    b.

    c.

    d.

    e.

11. Name the reason for storing herbicides separately.

12. Interpret the following De-Weed label by answering the questions below.

    a. What classification is this cardboard carton container?

    b. How would you dispose of this container?

    c. If you mixed too much pesticide for your blueberries (5 lbs per acre rate), on what other crop could you use it?

    d. How should you store this pesticide?

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (CAUTION)

Harmful if swallowed. Avoid application directly to humans. Care should be taken to avoid inhalation of dust or spray mist, or prolonged contact with skin. In case of contact, immediately flush eyes or skin with large amounts of water. Get medical attention if irritation persists. Wear safety goggles or face shield when handling.

### ENVIRONMENTAL HAZARDS

Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from target area.

## DIRECTIONS FOR USE GENERAL CLASSIFICATION

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Containers should be disposed of in an incinerator or landfill approved for pesticide containers, or buried in a safe place. Consult Federal, State, or local disposal authorities for approved alternate procedures such as limited open burning.

# DE WEED

**HERBICIDE**
**WETTABLE POWDER**

| | |
|---|---|
| ACTIVE INGREDIENT: weedout · tri-azoic acid | 80.0% |
| INERT INGREDIENTS: | 20.0% |
| TOTAL: | 100.0% |

## KEEP OUT OF REACH OF CHILDREN

## CAUTION

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED Induce vomiting
IF INHALED Remove to fresh air.
IF IN EYES Flush eyes with plenty of water
IF ON SKIN Remove clothing and wash with detergent and water.

MFG BY A-Z CHEMICALS
Aster, Minnesota

EPA ESTABLISHMENT NO. 1357-MN-1
EPA REGISTRATION NO. 1357-41

## DIRECTIONS FOR USE CONTINUED

DeWeed is for weed control in certain crops, ornamental plantings, on industrial sites, and around-the-farm. It should be applied before weeds emerge or following removal of weed growth. It controls a wide variety of annual broadleaf and grass weeds when used at selective rates in agricultural crops and ornamental plantings. When used at higher, non-selective rates in non crop areas, it also controls many perennial broadleaf and grass weeds.

GROUND APPLICATION: Use conventional spray equipment with 80° flat-fan nozzles. Screens in spray system should be no finer than 50 mesh. Use a pump with capacity to maintain 35-40 psi at nozzles. Use hydraulic or mechanical agitation during mixing and application to maintain a uniform suspension. Aerial application: Use only where specified in the use directions.

BLUEBERRIES and CANEBERRIES (blackberries, boysenberries, loganberries, raspberries)—Quackgrass. Apply 5 lbs per acre in the fall or split the application applying 2½ lbs per acre in the fall plus 2½ lbs per acre in the spring, when quackgrass is growing. Do not apply when fruit is present.

ALFALFA—Pure alfalfa less than one year old (Northeastern U.S. only)—Henbit, wild mustard, chickweed, alyssum, downy brome, wild oats, and pigweed. Pure alfalfa which has been seeded in the spring (before June 1) may be treated in the fall after the last cutting but before frozen ground conditions. Apply 1 lb. of DeWeed per acre. For ground application apply in a minimum of 2½ gals. of water per acre.

GRASSES GROWN FOR SEED (Pacific Northwest only). Perennial ryegrass, tall fescue and fine fescues, such as Pennlawn, Chewings, Rainier, and related species. Control of broadleaf weeds and annual grasses including annual ryegrass, rattail fescue, silver hairgrass and downy brome. Apply 3½ lbs of DeWeed in a minimum of 15 gals of water per acre as soon as fall rains start. Apply only to grasses from which at least one seed crop has been cut.

WEED CONTROL on industrial sites, highway medians, and shoulders, railroad rights-of-way, lumber yards, and in non-crop areas on farms such as around buildings, fuel storage areas, along fences, roadsides, and lanes. Aerial application may be made where it is feasible. Use at least 1 gal of water for each 1 lb. of DeWeed; use more water if practical for both ground and aerial application. To control annual broadleaf and grass weeds (including barnyard grass, cheat, crabgrass, lambsquarters, foxtail, ragweed, puncturevine and mullein), apply 8-12½ lbs. per acre. To control most annual and many perennial broadleaf and grass weeds (including quackgrass, bluegrass, redtop, burdock, Canada thistle, orchardgrass, dogfennel, and plantain), apply 12½-25 lbs. per acre. To control hard-to-kill perennial weeds (including bull thistle and sow thistle), apply 25-50 lbs. per acre.

NET WEIGHT FIVE POUNDS

## DISPOSAL AND STORAGE
## UNIT X

## ANSWERS TO TEST

1. a. 7
   b. 8
   c. 6
   d. 9
   e. 5
   f. 10
   g. 4
   h. 11
   i. 3
   j. 12
   k. 2
   l. 1

2. a. Burnable containers
   b. Nonburnable containers
   c. Containers with mercury, lead, cadmium, arsenic, or inorganic pesticides

3. a. Empty the container into the tank and let it drain 30 seconds
   b. Fill it one-fifth to one-fourth full of water or other diluent
   c. Replace cap and rotate container to rinse all sides
   d. Drain rinse from container into tank and let drain for 30 seconds
   e. Repeat rinse and drain a total of three (3) times

4. Any three of the following:
   a. Open burning
   b. Burial
   c. Recycling
   d. Incineration in a special pesticide-approved incinerator
   e. Chemical degradation
   f. Soil injection
   g. Encapsulation

5. Discussion should include:
   a. Try to find other areas with the same problem and use up any extra tank mix, if you mix too much pesticide for a job
   b. Return unused pesticides to manufacturer
   c. Use one of the other disposal methods listed after consulting an expert

6. a. Location of sensitive areas, especially streams, ponds, and other water supplies
   b. Personal safety
   c. Environmental safety
7. Any five of the following:
   a. Child-proof
   b. Cool, dry, well-ventilated room or building
   c. Fire-resistant
   d. Fenced in or at least able to be locked
   e. Warning signs posted on doors and windows
   f. Supplied with detergent, hand cleaner, and water
   g. Supplied with absorbent materials, such as sand, sawdust, and paper
   h. Supplied with shovel, broom, dust pan, and fire extinguisher
8. Discussion should include:
   a. Where water supply will not be contaminated even if there is an accident or fire
   b. Free from flooding
   c. Downwind and downhill from sensitive area
   d. No problem with runoff or drainage
9. Discussion should include:
   a. Check containers often for leaks, corrosion, and loose caps
   b. Store pesticides in original containers
   c. Label any substitute containers with the entire label
   d. Keep partly empty pesticide containers tightly closed
   e. Wear protective clothing and equipment
10. a. Separate similar containers to avoid the chance of a mistake
    b. Store containers with label in plain sight
    c. Store on shelves off the floor
    d. Keep containers in upright position to prevent spills
    e. Place containers in orderly rows

11. Some herbicides, such as 2,4-D, can vaporize (become a gas) and get into the other pesticides nearby

12. a. Burnable

    b. Open burning if allowed by federal, state, and local laws. Otherwise, bury in an approved landfill or in a safe place away from water supplies or in an incinerator

    c. Caneberries

    d. In original container in a dry, locked pesticide storage area where water, food, and feed will not be contaminated

# RECORD KEEPING AND LIABILITY
## UNIT XI

### TERMINAL OBJECTIVE

After completion of this unit, the student should be able to list reasons for keeping records of pesticide use, complete standard record keeping form, name common claims brought against applicators, and describe things to do when involved in a legal problem. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

### SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. List reasons for keeping records of pesticide use.
2. List items of information needed for record keeping.
3. Name common claims brought against applicators.
4. List ways in which cross contamination may occur.
5. Describe things to do when involved in a legal problem.
6. Discuss insurance for pesticide mishaps.
7. Complete a standard record keeping form.

## RECORD KEEPING AND LIABILITY
## UNIT XI

### SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide student with objective sheet.

  B. Provide student with information and assignment sheets.

  C. Make transparency.

  D. Discuss terminal and specific objectives.

  E. Discuss information and assignment sheets.

  F. Assign students a pesticide. Ask them to decide when the weather conditions would allow a "safe" job and fill in a record keeping form accordingly.

  G. Hold a mock trial with students acting as defendent, lawyers, accusor, jury, etc.

  H. Give test.

II. Student:

  A. Read objective sheet.

  B. Study information sheet.

  C. Complete assignment sheet.

  D. Take test.

### INSTRUCTIONAL MATERIALS

I. Objective sheet

II. Information sheet

III. Transparency master: TM 1--Spray Record Sheet

IV. Assignment Sheet #1--Complete Standard Record Keeping Form

V. Answers to assignment sheet

VI. Test

VII. Answers to test

# RECORD KEEPING AND LIABILITY
## UNIT XI

## INFORMATION SHEET

I. Reasons for keeping records of pesticide use

   A. Help in finding an error if an error is made

   B. Provide information to trace residue and/or damage problems

   C. Help save money

   D. Allow one to compare the results obtained from different pesticides

   E. Help to reduce pesticide misuse

   F. Provide guide to buying specific amount of pesticide needed

   G. Establish proof of proper use in damage suit

II. Items of information needed for record keeping (Transparency 1)

   A. Date and time of application

   B. Area or target treated and pest

   C. Equipment used

   D. Name of product, formulation, lot number, establishment number, and rate

   E. Total formulation added to tank or hopper

   F. Amount of mixture used

   G. Amount treated and location

   H. Additional comments

   (NOTE: The more information included on the record, the more useful the record will be. Carry a notebook in the field to have all the information right there in front of you. Fill in a standard form to be sure you get all the necessary data every time.)

III. Common claims brought against applicators

(NOTE: In many instances you will be both the grower and the applicator. However, the applicator may be a hired person or a neighbor with whom you trade services.)

A. Drift

(NOTE: Drifting pesticides are a major cause of environmental contamination and damage to nontarget areas. In general, the courts have held the applicator and the grower who hired him jointly liable in drift cases. The grower is responsible when he hires or contracts for a "particularly dangerous operation," such as the application of pesticides. However, the grower may file another suit against the applicator claiming that the applicator agreed not to cause drift damage. The manufacturer of the pesticide may be held liable in drift cases in certain instances. If the label doesn't clearly warn about the possibility of drift, the manufacturer may share liability.)

B. Crop injury

(NOTE: Claims of injury to the crop that was treated or claims that the pesticide had not performed as expected involve the dealer, the manufacturer, and the applicator. The courts must decide which of the three recommended or guaranteed the product for that specific use on that crop. The party in error must accept the blame and pay damages. Applicators must make sure that all the pesticides they use are recommended on the label for that purpose. Then the blame may be the manufacturer's. If the crop injury was not great or total, the grower must show how much damage was from the pesticide and how much was from other conditions, such as weather or disease. This breakdown is not necessary in cases with great or total injury.)

C. Personal injury

(NOTE: The application of pesticides is considered an especially dangerous or, in legal terms, an "ultrahazardous" activity. As a result, the pesticide applicator is liable for any injury to a person from the pesticide. Usually the injured person can recover damages without proving negligence of the applicator. The injured party must only prove that he is free of any negligence and did not assume the risk of pesticide exposure. Pest control operators or exterminators are sometimes a special case. The liability in most cases involving personal injury or death depends on proving the applicator negligent.)

D. Wrong field

(NOTE: If the pesticide is applied on a field, crop, or area other than the one for which it was intended, serious problems can result. In the event that damage or overtolerance occurs or that the owner just didn't want the area treated, the applicator may be charged with trespass. Defense is very difficult. Double check on address, field location, and all landmarks before you or your hired person treat an area. Applying pesticides to the wrong field can be costly.)

E. Bees

(NOTE: Honeybees are very important to the grower and often he has his own colonies or hives. Unfortunately, bees are insects and are very susceptible to many pesticides. If the bees in hives are killed as the result of drift from nearby fields, the applicator is usually held legally responsible. Often he must pay damages. However, if the bees contacted the pesticides while in the sprayed fields, the applicator may not be liable. The courts have sometimes ruled that the bee is trespassing and that the land doesn't need to be safe to uninvited animals. Play it safe! Know where the beehives are located in your area. Protect your hives and your neighbor's hives by relocating or covering them before you spray.)

F. Attractive nuisance

(NOTE: The rulings on "attractive nuisance" usually involve cases when children are attracted to ground equipment or aircraft and injure themselves. The owner and/or applicator are held liable for leaving the "nuisance" where a child could be "attracted" to it. In one case, a young boy, seeing a small airplane parked in the corner of an airport, took his ax and chopped the plane into several pieces. Unfortunately, at one point the hatchet hit the plane, then slipped and cut his foot. The court under the "attractive nuisance" claim awarded the boy $5,000 from the airplane's owner.)

G. Noise

(NOTE: Claims have been brought against applicators for noise damage. Owners of mink, poultry, turkey, and occasionally cattle claim injury to their animals from fright caused by noise of aircraft and ground equipment operating above or near their ranch. They must prove direct loss of property due to noise from machinery operated carelessly or negligently. In some cases, the ranch owner will claim that an applicator made an unlawful flight over his property without his permission. This is especially important in aerial applications when pullups over nearby property are necessary. Successful defense is possible when the applicator can show that the noise wasn't the cause of injury or that no injury occurred.)

IV. Ways in which cross contamination may occur

(NOTE: Every year there are cases where a pesticide contains not only the pesticide named on the label but also another pesticide as well.)

A. Manufacturer may make a mistake in labeling or formulating the product

B. Applicator may make a mistake in mixing or filling in the spray tank or he may not have removed from the tank all the pesticide left over from the last application

C. Open container of herbicides, such as 2,4D, can vaporize (become a gas) and penetrate other pesticides which are stored nearby

(NOTE: The applicator must know which container of pesticide was used on the crop so that laboratory tests can be made. The lab tests can show whether the contamination occurred during mixing and filling or earlier. In cases involving herbicide contamination, it is difficult to prove whether it is the result of vaporization during storage or a manufacturer formulation error. The courts must decide who is to blame.)

V. Things to do when involved in a legal problem

A. Examine records to make sure that you were actually operating in the area at the time of the alleged injury

B. Make sure that all of your records are up-to-date, particularly as to the identity of the equipment used, temperatures, wind direction and velocity, and all other pertinent data

C. Proceed to the scene immediately and make notes of all essential information

D. Record any adverse conditions that you observe at the time of your investigation, particularly insect infestations, disease, water stress, late planting, carry-over effect from other materials or herbicides, and age of crop

E. Use close-up color photography to record any adverse condition found

(NOTE: The close-ups are necessary so that symptoms can be examined by an expert.)

F. Save the container from which the product used on the job was removed

(NOTE: If it is not practical to save the whole container, use close-up color photography to record the label.)

G. Request permission to have an expert examine the crop or the property in order to have the benefit of his opinion

(NOTE: This should be done if you do not have insurance for the loss involved.)

H. Notify the chemical company immediately so they can send their experts to the site if they are involved

I. Obtain the names and addresses of all witnesses who might testify as to the nature of the operation and the conditions of the crop before and after application

# INFORMATION SHEET

VI. Insurance for pesticide mishaps

- A. Types of insurance plans
    - 1. Bodily injury
    - 2. Property damage
    - 3. Restricted chemical liability
    - 4. Comprehensive chemical
- B. Points to consider
    - 1. Cost
    - 2. Benefits
    - 3. Drawbacks

# Spray Record Sheet

| Date and Time | Area or Target Treated and Pest | Equipment | Pesticide Name & Formulation, EPA Reg. Number, EPA Est. Number, & Rate (per acre, per 100 gallons, etc.) | Total Formulation Added To Tank or Hopper | Amount of Mixture Used | Amount Treated and Location | Additional Comments (Weather, applicator, severity of infestion, etc.) |
|---|---|---|---|---|---|---|---|
| 5/12/73<br>3-5 PM | Smith's Alfalfa, Weevil | Lawrence Blower | Malathion Methoxychlor Double M, EC<br>3 qts./acre<br>EPA Reg. #4625-329<br>EPA Est. #4625-NC-1 | 15 Gal. | 50 Gal. | 20 acres Fields across the road from Jones | NE winds at 4 mph, sunny 70°, driver KAP, Alfalfa Weevil |
| 5/14/73<br>7-9 pm | Smith's Calves, Lice | Root-Lowell | Ciovap S<br>1 oz./animal<br>EPA Reg. #3765-153<br>EPA Est. #3765-AK-1 | 4 Gal. | 4 Gal. | 500 Calves | Lice on Calves, Calves 5 weeks old, condition good, #47 sick, Helper KAP |
|  |  |  |  |  |  |  |  |

## RECORD KEEPING AND LIABILITY
## UNIT XI

### ASSIGNMENT SHEET #1--COMPLETE STANDARD RECORD KEEPING FORM

Complete the standard form based on the information below and the labels on the following pages.

(NOTE: The student should use his/her last name as the owner of the fields.)

1. You sprayed your 6 acre potato field located north of the house for cabbage looper using De-Metho. You used a low pressure boom sprayer and sprayed on May 15, 1974, at 8:00 a.m. You had a 150 gallon tank and added 6 quarts to the tank. It took you 30 minutes. The wind was calm; no nearby crops or weeds were in bloom; and there was a heavy infestation.

2. You sprayed your snap beans for white rot on May 15, 1974, at 9:00 a.m. You used a boom sprayer and sprayed all 10 acres of beans in the field southeast of the barn. You were expecting a severe infestation and added 20 pounds of No-Disease to your 400 gallon tank. It took you an hour, the wind was calm; no nearby crops or weeds were in bloom.

| | Date and Time | Area or Target Treated and Pest | Equipment | Pesticide Name & Formulation, EPA Reg. Number, EPA Est. Number, & Rate (per acre,per 100 gallons, etc.) | Total Formulation Added To Tank or Hopper | Amount of Mixture Used | Amount Treated and Location | Additional Comments (Weather, applicator, severity of infestation, etc.) |
|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| | | | | | | | | |

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS

### (DANGER)

[illegible]

TO PHYSICIAN: De Metho [illegible]

### ENVIRONMENTAL HAZARDS

[illegible]

### PHYSICAL OR CHEMICAL HAZARDS

[illegible]

### DIRECTIONS FOR USE

[illegible]

### RE-ENTRY STATEMENT (IF APPLICABLE)

[illegible]

### CATEGORY OF APPLICATOR (IF APPLICABLE)

### STORAGE AND DISPOSAL

STORAGE—[illegible] DISPOSAL—[illegible]

## RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

## DE METHO

INSECTICIDE

Emulsifiable Concentrate

| | |
|---|---|
| ACTIVE INGREDIENT: METHOMYL | 24% |
| INERT INGREDIENTS: | 76% |
| TOTAL: | 100% |

**Net Content: 50 gallons**

THIS PRODUCT CONTAINS 1.8 LBS OF DE METHO PER GALLON

DE METHO IS A REGISTERED TRADEMARK OF A-Z CORPORATION

## KEEP OUT OF REACH OF CHILDREN

## DANGER — POISON

### STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED - Induce vomiting by giving a tablespoonful of salt in warm water. Repeat until vomitus is clear. Call a physician imm

IF INHALED - Remove to fresh air. Call a physician immediately.

IF IN EYES - Flush eyes with plenty of water for at least 15 minut physician immediately

IF ON SKIN - In case of contact, remove contaminated clothing and im wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
PEST TOWN, VERMONT

**ESTABLISHMENT NO. 1357-VT-1**
**EPA REGISTRATION NO. 1357-43**

### DIRECTIONS FOR USE CONTINUED

### SPRAY PREPARATION

[illegible]

### APPLICATION

[illegible]

### NOTICE TO BUYER

[illegible]

[illegible]

### CROP USAGE

[illegible]

SPECIMEN

## DIRECTIONS

No-Disease Benomyl Fungicide should be used only in accordance with recommendations on this label, or in separate published Kill-Dead recommendations available through local dealers.

No-Disease Fungicide is recommended for the control of many important plant diseases. As a foliar treatment, it provides systemic, curative (eradicant), and protective action. If treatment is not effective following use of No-Disease as recommended, a tolerant strain of fungi may be present (contact your Kill-Dead representative); consideration should be given to prompt use of other suitable fungicides.

Apply as a spray (except as otherwise directed), using sufficient water to obtain thorough coverage of the plants. For aerial application (peanuts and sugar beets only), use 5 to 10 gals. per acre. Under severe disease conditions, use the higher rate and shorter interval specified for each crop; also, for tree crops, use the higher rate for large mature trees.

Add required amount of No-Disease to a partially filled spray tank agitated by hydraulic or mechanical means; continuous agitation is required to keep the material in suspension. Do not use alkaline pesticides, such as basic copper sulfate, Bordeaux mixture, or lime sulfur, as a tank mixture with

**ALMONDS:** **Brown Rot Blossom Blight**—Apply 1 to 1½ lbs. per acre at pink bud. Under severe disease conditions and on highly susceptible varieties, make a second application during half to full bloom.

**APPLES, PEARS:** Apply 200 to 500 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with sprayers. Do not graze livestock in treated orchards.

**Scab (Apples), Powdery Mildew, Sooty Blotch, Flyspeck**—Use 4 to 6 oz. per 100 gals. at ½" green tip and repeat at 7- to 14-day intervals (or as needed) through the cover sprays. If an application is missed and an infection period has occurred, apply 6 oz. per 100 gals. as soon as possible after the infection period in order to inactivate scab and to prevent further infection. With Golden Delicious apples, adverse effects on fruit finish and color may result; if finish and color are of primary importance, do not use more than 4 oz. per 100 gals.

**Postharvest Fruit Rots (Botrytis sp., Penicillium sp., Gloeosporium sp.)**—Make a single application of 6 oz. per 100 gals. 1 to 3 weeks before harvest. For additional protection of fruit to be held in storage, thoroughly wet harvested fruit by dipping or spraying at 8 oz. per 100 gals.

**Overwintering Scab (Apples)**—Apply 8 oz. per 100 gals. after harvest but before leaf drop. Thorough wetting of foliage is necessary.

**BEANS (SNAP):** **White Rot (Sclerotinia), Gray Mold (Botrytis)**—Apply 1½ to 2 lbs. per acre at 25% to 50% bloom; repeat at peak bloom. Do not apply within 14 days of harvest; do not graze or feed treated bean vines or hay to livestock.

**CUCURBITS—CUCUMBERS, MELONS, SUMMER AND WINTER SQUASH:** **Gummy Stem Blight, Powdery Mildew, Anthracnose**—Apply 4 to 8 oz. per acre. Begin applications when plants begin to run or when disease first appears, and repeat at 7- to 14-day intervals as needed.

**MACADAMIA NUTS (HAWAII):** **Botrytis Blossom Blight**—Apply 1½ lbs. per acre; a surfactant may be added to the spray to improve wetting of foliage. Begin applications 1 to 2 weeks prior to bloom, and repeat at 7- to 14-day intervals through the bloom period.

**MANGOES:** **Anthracnose**—Apply 1 to 2 lbs. per acre. Begin applications at first appearance of panicles (approx. 2" long), and repeat at weekly intervals until all fruits are set. Continue at 3- to 4-week intervals. Do not apply within 14 days of harvest.

**MUSHROOMS:** **Verticillium Spot (Dry Bubble)**—Use 1 lb. per 100 gals. and apply to bed surface at the rate of 12½ gals. per 1000 sq. ft. Apply immediately after casing and repeat at pinning; alternatively, if disease has occurred, apply to beds after picking and repeat 10 days later. Do not apply within 2 days of harvest.

**PEANUTS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application 35 to 40 days after planting or when disease first appears, and repeat at 14- to 21-day intervals as needed. Do not apply within 14 days of harvest.

CONTINUED ON RIGHT PANEL

# NO-DISEASE

BENOMYL FUNGICIDE

**Wettable Powder**

**ACTIVE INGREDIENT**
Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate] 50%
**INERT INGREDIENTS** 50%

U.S. Pats. 3,541,213 & 3,631,176 EPA Est. 1352-WV-1 EPA Reg. No. 1352-354-AA

**Keep out of reach of children.**

**CAUTION!** MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.
Avoid breathing dust or spray mist. Avoid contact with skin, eyes, and clothing.
Wash thoroughly after using. Keep away from fire or sparks.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

**IMPORTANT**—Never allow No-Disease to become wet during storage. This may lead to certain chemical changes which will reduce the effectiveness of No-Disease as a fungicide. Keep container closed when not in use. Do not re-use container; crush and bury when empty.

This product is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes.

**NET 50 LBS.**

8-21150 8-73A Made in U.S.A. Printed in U.S.A.

**KILL-DEAD CHEMICALS**
Chemical City, West Virginia

**PECANS:** **Pecan Scab, Brown Leafspot, Downy Spot, Powdery Mildew**—Apply ½ to 1 lb. per acre; use the higher rate for trees over 30 ft. tall. A surfactant may be added to the spray to improve wetting of foliage. Apply at prepollination when young leaves are unfolding, when small nuts are forming, and thereafter at 3- to 4-week intervals. Do not apply after shucks split.

**PINEAPPLE:** **Pineapple Butt Rot (Thielaviopsis paradoxa)**—Use 1½ lbs. per 100 gals. of water as preplant dip treatment. Immerse seedpieces to give thorough wetting; remove and allow to drain.

**STONE FRUITS—APRICOTS, CHERRIES, NECTARINES, PEACHES, PLUMS, PRUNES:** Apply 150 to 400 gals. of spray per acre with hydraulic ground equipment or equivalent amount of No-Disease per acre with concentrate sprayers. Do not graze livestock in treated orchards.

**Brown Rot Blossom Blight, Fruit Brown Rot**—Use 1 lb. per 100 gals. (in combination with dormant oil) as a delayed dormant treatment prior to bud break. Use ½ lb. per 100 gals. at early bloom (popcorn, red bud, or green tip) and at full bloom; apply 1 or 2 additional sprays beginning 3 weeks before harvest.

For following diseases, use the same schedule as for Brown Rot plus additional applications of ½ lb. per 100 gals. as indicated: **Peach Scab**—shuck split and shuck fall; **Powdery Mildew**—shuck fall and first cover; **Cherry Leaf Spot**—2 to 3 weeks after harvest.

**Postharvest Fruit Rots**—Dip or spray fruit thoroughly as soon as possible after harvest; use ½ lb. per 100 gals. No-Disease does not control fruit rots caused by Rhizopus spp. and Alternaria spp.

**STRAWBERRIES:** **Gray Mold (Botrytis), Powdery Mildew, Leaf Scorch, Leaf Blight, Leaf Spot**—Apply 1 lb. per acre at 10% bloom and at full bloom; continue at 10- to 14-day intervals, using ½ lb. per acre. **Anthracnose**—Apply 1 lb. per acre when plants are established (plant bed or field) and repeat at 7-day intervals.

**SUGAR BEETS:** **Cercospora Leafspot**—Apply 6 to 8 oz. per acre. Begin application when disease first appears and repeat at 14- to 21-day intervals as needed. Do not apply within 21 days of harvest.

**SUGARCANE (HAWAII):** **Pineapple Disease (Ceratocystis paradoxa)**—Apply to cut seedpieces either as a cold dip or hot dip.

*Cold Dip*—Use 8 oz. per 100 gals. of water (1:1600). Immerse seedpieces to give thorough wetting; remove and allow to drain.

*Hot Dip*—Use 4 oz. per 100 gals. of water (1:3200). Maintain temperature of the dip at 50°C. Soak seedpieces for 20 to 30 minutes, remove and allow to drain.

Note: Do not use treated seedpieces for food or feed purposes.

**ROSES** (Powdery Mildew, Black Spot); **FLOWERS, ORNAMENTALS** (Powdery Mildew, Botrytis Gray Mold): Field and Greenhouse—Use 8 oz. per 100 gals. of water (1 tablespoonful per 2 gals.); for Black Spot of roses, use 1 lb. per 100 gals. Apply when disease first appears and repeat at 10- to 14-day intervals throughout the growing season; shorten interval during humid, rainy weather. Addition of a surfactant to the spray mixture enhances curative action of the fungicide, and improves distribution of the spray on hard-to-wet plants such as roses.

**BULBS** (Easter Lily, Tulip, Gladiolus, Daffodil, Iris): Fusarium and Penicillium Rots—Use 1½ lbs. per 100 gals. of water (2 tablespoonfuls per gal.). Soak cleaned bulbs for 15 to 30 minutes in warm dip (80 to 85°F.), preferably within 48 hours after digging. Dry bulbs after treatment. If bulbs are for forcing, treat after bulbs have been heat cured.

**NOTICE TO BUYER**—Seller warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. This warranty does not extend to use of this product contrary to label use directions, or under abnormal use conditions, or under conditions not reasonably foreseeable to seller; buyer assumes all risk of any such use. Seller makes no other warranties, express or implied.

Purchase of this material does not confer any rights under patents of countries outside of the United States.

# RECORD KEEPING AND LIABILITY
# UNIT XI

## ANSWERS TO ASSIGNMENT SHEET

| Date and Time | Area or Target Treated and Pest | Equipment | Pesticide Name & Formulation, EPA Reg. Number, EPA Est. Number, & Rate (per acre,per 100 gallons, etc.) | Total Formulation Added To Tank or Hopper | Amount of Mixture Used | Amount Treated and Location | Additional Comments (Weather, applicator, severity of infection, etc.) |
|---|---|---|---|---|---|---|---|
| 5-15-75 8:00 - 8:30 AM | Student's last name Potato field for cabbage looper | Low pressure boom spray 25 gal/acre | De Metho EC, A-Z Chemicals EPA Reg. No. 1357-43 EPA Est. No.1357-VT-1 2 pts./acre | 6 qts. or 12 pts. of 1.8EC | 150 gal. | 6 acres Field north of house | Wind calm, no crops or weeds in bloom, heavy infestation |
| 5-15-74 9:00 - 10:00 AM | Student's last name Beanfield for white rot | Boom sprayer 40 gal/acre | No-Disease WP Kill-Dead Chemicals EPA Reg. No. 1352-354-AA EPA Est. No. 1352-WV-1 | 20 lb. of 50% WP | 400 gal. | 10 acres Field southeast of barn | Heavy infestation, wind calm, no nearby crops or weeds in bloom |

# RECORD KEEPING AND LIABILITY
## UNIT XI

## TEST

1. List four reasons for keeping records of pesticide use.

   a.

   b.

   c.

   d.

2. List four items of information needed for record keeping.

   a.

   b.

   c.

   d.

3. Name three common claims brought against applicators.

   a.

   b.

   c.

4. List the ways in which cross contamination may occur.

   a.

   b.

   c.

5. Describe three things to do when involved in a legal problem.

   a.

   b.

   c.

6. Discuss insurance for pesticide mishaps.

7. Complete the following standard record keeping form using the information below.

Mr. Green sprayed his 100 calves for hornflies on June 4, 1975, at 8:00 a.m. He used a power sprayer which held 25 gallons of water. Fly-Off 50 WP was the pesticide used at 2#/25 gallons of water. The chemical was manufactured by A - Z; the EPA Registration Number was 1357-375 and the EPA Establishment Number was 1357-WV-1. It took 2 hours; the weather was clear; infestation was light. The wind was eight miles per hour.

| Date and Time | Area or Target Treated and Pest | Equipment | Pesticide Name & Formulation, EPA Reg. Number, EPA Est. Number, & Rate (per acre, per 100 gallons, etc.) | Total Formulation Added To Tank or Hopper | Amount of Mixture Used | Amount Treated and Location | Additional Comments (Weather, applicator, severity of infestation, etc.) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

## RECORD KEEPING AND LIABILITY
## UNIT XI

## ANSWERS TO TEST

1. Any four of the following:
   - a. Help in finding an error if an error is made
   - b. Provide information to trace residue and/or damage problems
   - c. Help save money
   - d. Allow one to compare the results obtained from different pesticides
   - e. Help to reduce pesticide misuse
   - f. Provide guide to buying specific amount of pesticide needed
   - g. Establish proof of proper use in damage suit
2. Any four of the following:
   - a. Date and time of application
   - b. Area or target treated and pest
   - c. Equipment used
   - d. Name of product, formulation, lot number, establishment number, and rate
   - e. Total formulation added to tank or hopper
   - f. Amount of mixture used
   - g. Amount treated and location
   - h. Additional comments
3. Any three of the following:
   - a. Drift
   - b. Crop injury
   - c. Personal injury
   - d. Wrong field
   - e. Bees
   - f. Attractive nuisance
   - g. Noise

350

4. a. Manufacturer may make a mistake in labeling or formulating the product

   b. Applicator may make a mistake in mixing or filling in the spray tank or he may not have removed from the tank all the pesticide left over from the last application

   c. Open container of herbicides, such as 2,4D, can vaporize (become a gas) and penetrate other pesticides which are stored nearby

5. Any three of the following:

   a. Examine records to make sure that you were actually operating in the area at the time of the alleged injury

   b. Make sure that all of your records are up-to-date, particularly as to the identity of the equipment used, temperatures, wind direction and velocity, and other pertinent data

   c. Proceed to the scene immediately and make notes of all essential information

   d. Record any adverse conditions that you observe at the time of your investigation, particularly insect infestations, disease, water stress, late planting, carry-over effect from other materials or herbicides, and age of crop

   e. Use close-up color photography to record any adverse condition found

   f. Save the container from which the product used on the job was removed

   g. Request permission to have an expert examine the crop or the property in order to have the benefit of his opinion

   h. Notify the chemical company immediately so they can send their experts to the site if they are involved

   i. Obtain the names and addresses of all witnesses who might testify as to the nature of the operation and the conditions of the crop before and after application

6. Discussion should include:

   a. Types of insurance plans

      1) Bodily injury

      2) Property damage

      3) Restricted chemical liability

      4) Comprehensive chemical

b. Points to consider

1) Cost

2) Benefits

3) Drawbacks

7.

| Date and Time | Area or Target Treated and Pest | Equipment | Pesticide Name & Formulation, EPA Reg. Number, EPA Est. Number, & Rate (per acre, per 100 gallons, etc.) | Total Formulation Added To Tank or Hopper | Amount of Mixture Used | Amount Treated and Location | Additional Comments (Weather, applicator, severity of infestation, etc.) |
|---|---|---|---|---|---|---|---|
| 6-4-75<br>8:00 - 10:00 AM | Green's Calves, hornflies | Power sprayer with single nozzle gun | Fly-Off 50 WP<br>A-Z Chemicals<br>EPA Reg. No. 1357-375, EPA Est. No. 1357 WV-1<br>2 lbs./25 gals. | 2 lbs. of 50%WP | 25 gal. | 100 calves | Weather clear, infestation light, wind 8 mph |
| | | | | | | | |

United States
Environmental Protection
Agency

Washington, D.C. 20460
April 1976

EPA

# The Federal Insecticide, Fungicide, and Rodenticide Act

## As Amended

Public Law 92-516
October 21, 1972
as amended by
Public Law 94-140
November 28, 1975

**Public Law 92–516, 92nd Congress, H.R. 10729, October 21, 1972**
**as amended by**
**Public Law 94–140, 94th Congress, H.R. 8841, November 28, 1975**

# An Act

**86 STAT. 973–999**

To amend the Federal Insecticide, Fungicide, and Rodenticide Act, and for other purposes.

**Federal Environmental Pesticide Control Act of 1972.**

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That this Act may be cited as the "Federal Environmental Pesticide Control Act of 1972".

## AMENDMENTS TO FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

**61 Stat. 163; 78 Stat. 190.**

SEC. 2. The Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.) is amended to read as follows:

## “SECTION 1. SHORT TITLE AND TABLE OF CONTENTS.

“(a) SHORT TITLE.—This Act may be cited as the ‘Federal Insecticide, Fungicide, and Rodenticide Act’.

“(b) TABLE OF CONTENTS.—

“Section 1. Short title and table of contents.
  “(a) Short title.
  “(b) Table of contents.
“Sec. 2. Definitions.
  “(a) Active ingredient.
  “(b) Administrator.
  “(c) Adulterated.
  “(d) Animal.
  “(e) Certified applicator, etc.
    “(1) Certified applicator.
    “(2) Private applicator.
    “(3) Commercial applicator.
    “(4) Under the direct supervision of a certified applicator.
  “(f) Defoliant.
  “(g) Desiccant.
  “(h) Device.
  “(i) District court.
  “(j) Environment.
  “(k) Fungus.
  “(l) Imminent hazard.
  “(m) Inert ingredient.
  “(n) Ingredient statement.
  “(o) Insect.
  “(p) Label and labeling.
    “(1) Label.
    “(2) Labeling.
  “(q) Misbranded.
  “(r) Nematode.
  “(s) Person.
  “(t) Pest.
  “(u) Pesticide.
  “(v) Plant regulator.
  “(w) Producer and produce.
  “(x) Protect health and the environment.
  “(y) Registrant.
  “(z) Registration.
  “(aa) State.
  “(bb) Unreasonable adverse effects on the environment.
  “(cc) Weed.
  “(dd) Establishment.
“Sec. 3. Registration of pesticides.
  “(a) Requirement.
  “(b) Exemptions.
  “(c) Procedure for registration.
    “(1) Statement required.
    “(2) Data in support of registration.
    “(3) Time for acting with respect to application.
    “(4) Notice of application.
    “(5) Approval of registration.
    “(6) Denial of registration.
  “(d) Classification of pesticides.
    “(1) Classification for general use, restricted use, or both.
    “(2) Change in classification.
  “(e) Products with same formulation and claims.
  “(f) Miscellaneous.
    “(1) Effect of change of labeling or formulation.
    “(2) Registration not a defense.
    “(3) Authority to consult other Federal agencies.
“Sec. 4. Use of restricted use pesticides; certified applicators.
  “(a) Certification procedure.
    “(1) Federal certification.
    “(2) State certification.
  “(b) State plans.
  “(c) Instruction in integrated pest management techniques.
“Sec. 5. Experimental use permits.
  “(a) Issuance.
  “(b) Temporary tolerance level.
  “(c) Use under permit.
  “(d) Studies.
  “(e) Revocation.

355

- "(f) State issuance of permits.
- "(g) Exemption for agricultural research agencies.

"Sec. 6. Administrative review; suspension.
- "(a) Cancellation after five years.
  - "(1) Procedure.
  - "(2) Information.
- "(b) Cancellation and change in classification.
- "(c) Suspension.
  - "(1) Order.
  - "(2) Expedite hearing.
  - "(3) Emergency order.
  - "(4) Judicial review.
- "(d) Public hearings and scientific review.
- "(e) Judicial review.

"Sec. 7. Registration of establishments.
- "(a) Requirement.
- "(b) Registration.
- "(c) Information required.
- "(d) Confidential records and information.

"Sec. 8. Books and records.
- "(a) Requirements.
- "(b) Inspection.

"Sec. 9. Inspection of establishments, etc.
- "(a) In general.
- "(b) Warrants.
- "(c) Enforcement.
  - "(1) Certification of facts to Attorney General.
  - "(2) Notice not required.
  - "(3) Warning notices.

"Sec. 10. Protection of trade secrets and other information.
- "(a) In general.
- "(b) Disclosure.
- "(c) Disputes.

"Sec. 11. Standards applicable to pesticide applicators.
- "(a) In general.
- "(b) Separate standards.

"Sec. 12. Unlawful acts.
- "(a) In general.
- "(b) Exemptions.

"Sec. 13. Stop sale, use, removal, and seizure.
- "(a) Stop sale, etc., orders.
- "(b) Seizure.
- "(c) Disposition after condemnation.
- "(d) Court costs, etc.

"Sec. 14. Penalties.
- "(a) Civil penalties.
  - "(1) In general.
  - "(2) Private applicator.
  - "(3) Hearing.
  - "(4) References to Attorney General.
- "(b) Criminal penalties.
  - "(1) In general.
  - "(2) Private applicator.
  - "(3) Disclosure of information.
  - "(4) Acts of officers, agents, etc.

"Sec. 15. Indemnities.
- "(a) Requirement.
- "(b) Amount of payment.
  - "(1) In general.
  - "(2) Special rule.

"Sec. 16. Administrative procedure; judicial review.
- "(a) District court review.
- "(b) Review by Court of Appeals.
- "(c) Jurisdiction of district courts.
- "(d) Notice of judgments.

"Sec. 17. Imports and exports.
- "(a) Pesticides and devices intended for export.
- "(b) Cancellation notices furnished to foreign governments.
- "(c) Importation of pesticides and devices.
- "(d) Cooperation in international efforts.
- "(e) Regulations.

"Sec. 18. Exemption of Federal agencies.

"Sec. 19. Disposal and transportation.
- "(a) Procedures.
- "(b) Advice to Secretary of Transportation.

"Sec. 20. Research and monitoring.
- "(a) Research.
- "(b) National monitoring plan.
- "(c) Monitoring.

"Sec. 21. Solicitation of public comments; notice of public hearings.

"Sec. 22. Delegation and cooperation.
- "(a) Delegation.
- "(b) Cooperation.

"Sec. 23. State cooperation, aid, and training.
- "(a) Cooperative agreements.
- "(b) Contracts for training.

"Sec. 24. Authority of States.

"Sec. 25. Authority of Administrator.
- "(a) (1) Regulations.
  - "(2) Procedure.
    - "(A) Proposed regulations.
    - "(B) Final regulations.
    - "(C) Time requirements.
    - "(D) Publication in the Federal Register.
  - "(3) Congressional committees.
- "(b) Exemption of pesticides.
- "(c) Other authority.

"Sec. 26. Severability.

"Sec. 27. Authorization for appropriations.

## “SEC. 2. DEFINITIONS.

“For purposes of this Act—

“(a) Active Ingredient.—The term ‘active ingredient’ means—

“(1) in the case of a pesticide other than a plant regulator, defoliant, or desiccant, an ingredient which will prevent, destroy, repel, or mitigate any pest;

“(2) in the case of a plant regulator, an ingredient which, through physiological action, will accelerate or retard the rate of growth or rate of maturation or otherwise alter the behavior of ornamental or crop plants or the product thereof;

“(3) in the case of a defoliant, an ingredient which will cause the leaves or foliage to drop from a plant; and

“(4) in the case of a desiccant, an ingredient which will artificially accelerate the drying of plant tissue.

“(b) Administrator.—The term ‘Administrator’ means the Administrator of the Environmental Protection Agency.

“(c) Adulterated.—The term ‘adulterated’ applies to any pesticide if:

“(1) its strength or purity falls below the professed standard of quality as expressed on its labeling under which it is sold;

“(2) any substance has been substituted wholly or in part for the pesticide; or

“(3) any valuable constituent of the pesticide has been wholly or in part abstracted.

“(d) Animal.—The term ‘animal’ means all vertebrate and invertebrate species, including but not limited to man and other mammals, birds, fish, and shellfish.

“(e) Certified Applicator, Etc.—

“(1) Certified applicator.—The term ‘certified applicator’ means any individual who is certified under section 4 as authorized to use or supervise the use of any pesticide which is classified for restricted use.

“(2) Private applicator.—The term ‘private applicator’ means a certified applicator who uses or supervises the use of any pesticide which is classified for restricted use for purposes of producing any agricultural commodity on property owned or rented by him or his employer or (if applied without compensation other than trading of personal services between producers of agricultural commodities) on the property of another person.

“(3) Commercial applicator.—The term ‘commercial applicator’ means a certified applicator (whether or not he is a private applicator with respect to some uses) who uses or supervises the use of any pesticide which is classified for restricted use for any purpose or on any property other than as provided by paragraph (2).

“(4) Under the direct supervision of a certified applicator.—Unless otherwise prescribed by its labeling, a pesticide shall be considered to be applied under the direct supervision of a certified applicator if it is applied by a competent person acting under the instructions and control of a certified applicator who is available if and when needed, even though such certified applicator is not physically present at the time and place the pesticide is applied.

“(f) Defoliant.—The term ‘defoliant’ means any substance or mixture of substances intended for causing the leaves or foliage to drop from a plant, with or without causing abscission.

“(g) Desiccant.—The term ‘desiccant’ means any substance or mixture of substances intended for artificially accelerating the drying of plant tissue.

“(h) Device.—The term ‘device’ means any instrument or contrivance (other than a firearm) which is intended for trapping, destroying, repelling, or mitigating any pest or any other form of plant or animal life (other than man and other than bacteria, virus, or other microorganism on or in living man or other living animals); but not including equipment used for the application of pesticides when sold separately therefrom.

“(i) District Court.—The term ‘district court’ means a United States district court, the District Court of Guam, the District Court of the Virgin Islands, and the highest court of American Samoa.

“(j) Environment.—The term ‘environment’ includes water, air, land, and all plants and man and other animals living therein, and the interrelationships which exist among these.

“(k) Fungus.—The term ‘fungus’ means any non-chlorophyll-bearing thallophyte (that is, any non-chlorophyll-bearing plant of a lower order than mosses and liverworts), as for example, rust, smut, mildew, mold, yeast, and bacteria, except those on or in living man or other animals and those on or in processed food, beverages, or pharmaceuticals.

“(l) Imminent Hazard.—The term ‘imminent hazard’ means a situation which exists when the continued use of a pesticide during the time required for cancellation proceeding would be likely to result in unreasonable adverse effects on the environment or will involve unreasonable hazard to the survival of a species declared endangered by the Secretary of the Interior under Public Law 91–135.

83 Stat. 275.
16 USC 668aa–1.

"(m) INERT INGREDIENT.—The term 'inert ingredient' means an ingredient which is not active.

"(n) INGREDIENT STATEMENT.—The term 'ingredient statement' means a statement which contains—

"(1) the name and percentage of each active ingredient, and the total percentage of all inert ingredients, in the pesticide; and

"(2) if the pesticide contains arsenic in any form, a statement of the percentages of total and water soluble arsenic, calculated as elementary arsenic.

"(o) INSECT.—The term 'insect' means any of the numerous small invertebrate animals generally having the body more or less obviously segmented, for the most part belonging to the class insecta, comprising six-legged, usually winged forms, as for example, beetles, bugs, bees, flies, and to other allied classes of arthropods whose members are wingless and usually have more than six legs, as for example, spiders, mites, ticks, centipedes, and wood lice.

"(p) LABEL AND LABELING.—

"(1) LABEL.—The term 'label' means the written, printed, or graphic matter on, or attached to, the pesticide or device or any of its containers or wrappers.

"(2) LABELING.—The term 'labeling' means all labels and all other written, printed, or graphic matter—

"(A) accompanying the pesticide or device at any time; or

"(B) to which reference is made on the label or in literature accompanying the pesticide or device, except to current official publications of the Environmental Protection Agency, the United States Departments of Agriculture and Interior, the Department of Health, Education, and Welfare, State experiment stations, State agricultural colleges, and other similar Federal or State institutions or agencies authorized by law to conduct research in the field of pesticides.

"(q) MISBRANDED.—

"(1) A pesticide is misbranded if—

"(A) its labeling bears any statement, design, or graphic representation relative thereto or to its ingredients which is false or misleading in any particular;

"(B) it is contained in a package or other container or wrapping which does not conform to the standards established by the Administrator pursuant to section 25(c)(3);

"(C) it is an imitation of, or is offered for sale under the name of, another pesticide;

"(D) its label does not bear the registration number assigned under section 7 to each establishment in which it was produced;

"(E) any word, statement, or other information required by or under authority of this Act to appear on the label or labeling is not prominently placed thereon with such conspicuousness (as compared with other words, statements, designs, or graphic matter in the labeling) and in such terms as to render it likely to be read and understood by the ordinary individual under customary conditions of purchase and use;

"(F) the labeling accompanying it does not contain directions for use which are necessary for effecting the purpose for which the product is intended and if complied with, together with any requirements imposed under section 3(d) of this Act, are adequate to protect health and the environment;

"(G) the label does not contain a warning or caution statement which may be necessary and if complied with, together with any requirements imposed under section 3(d) of this Act, is adequate to protect health and the environment.

"(2) A pesticide is misbranded if—

"(A) the label does not bear an ingredient statement on that part of the immediate container (and on the outside container or wrapper of the retail package, if there be one, through which the ingredient statement on the immediate container cannot be clearly read) which is presented or displayed under customary conditions of purchase, except that a pesticide is not misbranded under this subparagraph if:

"(i) the size of form of the immediate container, or the outside container or wrapper of the retail package, makes it impracticable to place the ingredient statement on the part which is presented or displayed under customary conditions of purchase; and "(ii) the ingredient statement appears prominently on another part of the immediate container, or outside container or wrapper, permitted by the Administrator;

"(B) the labeling does not contain a statement of the use classification under which the product is registered;

"(C) there is not affixed to its container, and to the outside container or wrapper of the retail package, if there be one, through which the required information on the immediate container cannot be clearly read, a label bearing—

"(i) the name and address of the producer, registrant, or person for whom produced;

"(ii) the name, brand, or trademark under which the pesticide is sold;

"(iii) the net weight or measure of the content: *Provided*, That the Administrator may permit reasonable variations; and

"(iv) when required by regulation of the Administrator to effectuate the purposes of this Act, the registration number assigned to the pesticide under this Act, and the use classification; and

"(D) the pesticide contains any substance or substances in quantities highly toxic to man, unless the label shall bear, in addition to any other matter required by this Act—

"(i) the skull and crossbones;

"(ii) the word 'poison' prominently in red on a background of distinctly contrasting color; and

"(iii) a statement of a practical treatment (first aid or otherwise) in case of poisoning by the pesticide.

"(r) NEMATODE.—The term 'nematode' means invertebrate animals of the phylum nemathelminthes and class nematoda, that is, unsegmented round worms with elongated, fusiform, or saclike bodies covered with cuticle, and inhabiting soil, water, plants, or plant parts; may also be called nemas or eelworms.

"(s) PERSON.—The term 'person' means any individual, partnership, association, corporation, or any organized group of persons whether incorporated or not.

"(t) PEST.—The term 'pest' means (1) any insect, rodent, nematode, fungus, weed, or (2) any other form of terrestrial or aquatic plant or animal life or virus, bacteria, or other micro-organism (except viruses, bacteria, or other micro-organisms on or in living man or other living animals) which the Administator declares to be a pest under section 25(c)(1).

P.L. 94-140
89 Stat. 754

"(u) PESTICIDE.—The term 'pesticide' means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, and (2) any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant: *Provided*, That the term 'pesticide' shall not include any article (1)(a) that is a 'new animal drug' within the meaning of section 201(w) of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 321(w)), or (b) that has been determined by the Secretary of Health, Education, and Welfare not to be a new animal drug by a regulation establishing conditions of use for the article, or (2) that is an animal feed within the meaning of section 201(x) of such Act (21 U.S.C. 321(x)) bearing or containing an article covered by clause (1) of this proviso."

"(v) PLANT REGULATOR.—The term 'plant regulator' means any substance or mixture of substances intended, through physiological action, for accelerating or retarding the rate of growth or rate of maturation, or for otherwise altering the behavior of plants or the produce thereof, but shall not include substances to the extent that they are intended as plant nutrients, trace elements, nutritional chemicals, plant inoculants, and soil amendments. Also, the term 'plant regulator' shall not be required to include any of such of those nutrient mixtures or soil amendments as are commonly known as vitamin-hormone horticultural products, intended for improvement, maintenance, survival, health, and propagation of plants, and as are not for pest destruction and are nontoxic, nonpoisonous in the undiluted packaged concentration.

"(w) PRODUCER AND PRODUCE.—The term 'producer' means the person who manufactures, prepares, compounds, propagates, or processes any pesticide or device. The term 'produce' means to manufacture, prepare, compound, propagate, or process any pesticide or device.

"(x) PROTECT HEALTH AND THE ENVIRONMENT.—The terms 'protect health and the environment' and 'protection of health and the environment' mean protection against any unreasonable adverse effects on the environment.

"(y) REGISTRANT.—The term 'registrant' means a person who has registered any pesticide pursuant to the provisions of this Act.

"(z) Registration.—The term 'registration' includes reregistration.

"(aa) State.—The term 'State' means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Trust Territory of the Pacific Islands, and American Samoa.

"(bb) Unreasonable Adverse Effects on the Environment.—The term 'unreasonable adverse effects on the environment' means any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide.

"(cc) Weed.—The term 'weed' means any plant which grows where not wanted.

"(dd) Establishment.—The term 'establishment' means any place where a pesticide or device is produced, or held, for distribution or sale.

### "SEC. 3. REGISTRATION OF PESTICIDES.

"(a) Requirement.—Except as otherwise provided by this Act, no person in any State may distribute, sell, offer for sale, hold for sale, ship, deliver for shipment, or receive and (having so received) deliver or offer to deliver, to any person any pesticide which is not registered with the Administrator.

"(b) Exemptions.—A pesticide which is not registered with the Administrator may be transferred if—

"(1) the transfer is from one registered establishment to another registered establishment operated by the same producer solely for packaging at the second establishment or for use as a constituent part of another pesticide produced at the second establishment; or

"(2) the transfer is pursuant to and in accordance with the requirements of an experimental use permit.

"(c) Procedure for Registration.—

(1) Statement required.—Each applicant for registration of a pesticide shall file with the Administrator a statement which includes—

"(A) the name and address of the applicant and of any other person whose name will appear on the labeling;

"(B) the name of the pesticide;

"(C) a complete copy of the labeling of the pesticide, a statement of all claims to be made for it, and any directions for its use;

**P.L. 94-140**
**89 Stat. 755**

**Test data.**

(D) if requested by the Administrator, a full description of the tests made and the results thereof upon which the claims are based, except that data submitted on or after January 1, 1970, in support of an application shall not, without permission of the applicant, be considered by the Administrator in support of any other application for registration unless such other applicant shall have first offered to pay reasonable compensation for producing the test data to be relied upon and such data is not protected from disclosure by section 10(b). This provision with regard to compensation for producing the test data to be relied upon shall apply with respect to all applications for registration or reregistration submitted on or after October 21, 1972. If the parties cannot agree on the amount and method of payment, the Administrator shall make such determination and may fix such other terms and conditions as may be reasonable under the circumstances. The Administrator's determination shall be made on the record after notice and opportunity for hearing. If either party does not agree with said determination, he may, within thirty days, take an appeal to the Federal district court for the district in which he resides with respect to either the amount of the payment or the terms of payment, or both. Registration shall not be delayed pending the determination of reasonable compensation between the applicants, by the Administrator or by the court.

**Appeal.**

"(E) the complete formula of the pesticide; and

"(F) a request that the pesticide be classified for general use, for restricted use, or for both.

"(2) Data in support of registration.—The Administrator shall publish guidelines specifying the kinds of information which will be required to support the registration of a pesticide and shall revise such guidelines from time to time. If thereafter he requires any additional kind of information he shall permit sufficient time for applicants to obtain such additional information. Except as provided by subsection (c)(1)(D) of this section and section 10, within 30 days after the Administrator registers a pesticide under this Act he shall make available to the public the data called for in the registration statement together with such other scientific information as he deems relevant to his decision.

"(3) Time for acting with respect to application.—The Administrator shall review the data after receipt of the application and shall, as expeditiously as possible, either register the pesticide in accordance with paragraph (5), or notify the applicant of his determination that it does not comply with the provisions of the Act in accordance with paragraph (6).

Publication in Federal Register.

"(4) Notice of application.—The Administrator shall publish in the Federal Register, promptly after receipt of the statement and other data required pursuant to paragraphs (1) and (2), a notice of each application for registration of any pesticide if it contains any new active ingredient or if it would entail a changed use pattern. The notice shall provide for a period of 30 days in which any Federal agency or any other interested person may comment.

"(5) Approval of registration.—The Administrator shall register a pesticide if he determines that, when considered with any restrictions imposed under subsection (d)—

"(A) its composition is such as to warrant the proposed claims for it;

"(B) its labeling and other material required to be submitted comply with the requirements of this Act;

"(C) it will perform its intended function without unreasonable adverse effects on the environment; and

"(D) when used in accordance with widespread and commonly recognized practice it will not generally cause unreasonable adverse effects on the environment.

The Administrator shall not make any lack of essentiality a criterion for denying registration of any pesticide. Where two pesticides meet the requirements of this paragraph, one should not be registered in preference to the other.

"(6) Denial of registration.—If the Administrator determines that the requirements of paragraph (5) for registration are not satisfied, he shall notify the applicant for registration of his determination and of his reasons (including the factual basis) therefor, and that, unless the applicant corrects the conditions and notifies the Administrator thereof during the 30-day period beginning with the day after the date on which the applicant receives the notice, the Administrator may refuse to register the pesticide. Whenever the Administrator refuses to register a pesticide, he shall notify the applicant of his decision and of his reasons (including the factual basis) therefor. The Administrator shall promptly publish in the Federal Register notice of such denial of registration and the reasons therefor. Upon such notification, the applicant for registration or other interested person with the concurrence of the applicant shall have the same remedies as provided for in section 6.

Publication in Federal Register.

"(d) Classification of Pesticides.—

"(1) Classification for general use, restricted use, or both.—

"(A) As a part of the registration of a pesticide the Administrator shall classify it as being for general use or for restricted use, provided that if the Administrator determines that some of the uses for which the pesticide is registered should be for general use and that other uses for which it is registered should be for restricted use, he shall classify it for both general use and restricted use. If some of the uses of the pesticide are classified for general use and other uses are classified for restricted use, the directions relating to its general uses shall be clearly separated and distinguished from those directions relating to its restricted uses: *Provided, however,* That the Administrator may require that its packaging and labeling for restricted uses shall be clearly distinguishable from its packaging and labeling for general uses.

"(B) If the Administrator determines that the pesticide, when applied in accordance with its directions for use, warnings and cautions and for the uses for which it is registered, or for one or more of such uses, or in accordance with a widespread and commonly recognized practice, will not generally cause unreasonable adverse effects on the environment, he will classify the pesticide, or the particular use or uses of the pesticide to which the determination applies, for general use.

"(C) If the Administrator determines that the pesticide, when applied in accordance with its directions for use, warnings and cautions and for the uses for which it is registered, or for one or more of such uses, or in accordance with a widespread and commonly recognized practice, may generally cause, without additional regulatory restrictions, unreasonable adverse effects on the environment, including injury to the applicator, he shall classify the pesticide, or the particular use or uses to which the determination applies, for restricted use:

"(i) If the Administrator classifies a pesticide, or one or more uses of such pesticide, for restricted use because of a determination that the acute dermal or inhalation toxicity of the pesticide presents a hazard to the applicator or other persons, the pesticide shall be applied for any use to which the restricted classification applies only by or under the direct supervision of a certified applicator.

"(ii) If the Administrator classifies a pesticide, or one or more uses of such pesticide, for restricted use because of a determination that its use without additional regulatory restriction may cause unreasonable adverse effects on the environment, the pesticide shall be applied for any use to which the determination applies only by or under the direct supervision of a certified applicator, or subject to such other restrictions as the Administrator may provide by regulation. Any such regulation shall be reviewable in the appropriate court of appeals upon petition of a person adversely affected filed within 60 days of the publication of the regulation in final form.

**Publication in Federal Register.**

"(2) CHANGE IN CLASSIFICATION.—If the Administrator determines that a change in the classification of any use of a pesticide from general use to restricted use is necessary to prevent unreasonable adverse effects on the environment, he shall notify the registrant of such pesticide of such determination at least 30 days before making the change and shall publish the proposed change in the Federal Register. The registrant, or other interested person with the concurrence of the registrant, may seek relief from such determination under section 6(b).

"(e) PRODUCTS WITH SAME FORMULATION AND CLAIMS.—Products which have the same formulation, are manufactured by the same person, the labeling of which contains the same claims, and the labels of which bear a designation identifying the product as the same pesticide may be registered as a single pesticide; and additional names and labels shall be added to the registration by supplemental statements.

"(f) MISCELLANEOUS.—

"(1) EFFECT OF CHANGE OF LABELING OR FORMULATION.—If the labeling or formulation for a pesticide is changed, the registration shall be amended to reflect such change if the Administrator determines that the change will not violate any provision of this Act.

"(2) REGISTRATION NOT A DEFENSE.—In no event shall registration of an article be construed as a defense for the commission of any offense under this Act: *Provided*, That as long as no cancellation proceedings are in effect registration of a pesticide shall be prima facie evidence that the pesticide, its labeling and packaging comply with the registration provisions of the Act.

"(3) AUTHORITY TO CONSULT OTHER FEDERAL AGENCIES.—In connection with consideration of any registration or application for registration under this section, the Administrator may consult with any other Federal agency.

## "SEC. 4. USE OF RESTRICTED USE PESTICIDES; CERTIFIED APPLICATORS.

"(a) CERTIFICATION PROCEDURE.—

**Standards.**

"(1) FEDERAL CERTIFICATION.—Subject to paragraph (2), the Administrator shall prescribe standards for the certification of applicators of pesticides. Such standards shall provide that to be certified, an individual must be determined to be competent with respect to the use and handling of pesticides, or to the use and handling of the pesticide or class of pesticides covered by such individual's certification: *Provided, however*, That the certification standard for a private applicator shall, under a State plan submitted for approval, be deemed fulfilled by his completing a certification form. The Administrator shall further assure that such form contains adequate information and affirmations to carry out the intent of this Act, and may include in the form an affirmation that the private applicator has completed a training program approved by the Administrator so long as the program does not require the private applicator to take, pursuant to a requirement prescribed by the Administrator, any examination to establish competency in the use of the pesticide. The Administrator may require any pesticide dealer participating in a certification program to be licensed under a State licensing program approved by him.

**P.L. 94-140**
**89 Stat. 753**

"(2) STATE CERTIFICATION.—If any State, at any time, desires to certify applicators of pesticides, the Governor of such State shall submit a State plan for such purpose. The Administrator shall approve the plan submitted by any State, or any modification thereof, if such plan in his judgment—

"(A) designates a State agency as the agency responsible for administering the plan throughout the State;

"(B) contains satisfactory assurances that such agency has or will have the legal authority and qualified personnel necessary to carry out the plan;

"(C) gives satisfactory assurances that the State will devote adequate funds to the administration of the plan;

"(D) provides that the State agency will make such reports to the Administrator in such form and containing such information as the Administrator may from time to time require; and

"(E) contains satisfactory assurances that State standards for the certification of applicators of pesticides conform with those standards prescribed by the Administrator under paragraph (1).

Any State certification program under this section shall be maintained in accordance with the State plan approved under this section.

Hearing.

"(b) STATE PLANS.—If the Administrator rejects a plan submitted under this paragraph, he shall afford the State submitting the plan due notice and opportunity for hearing before so doing. If the Administrator approves a plan submitted under this paragraph, then such State shall certify applicators of pesticides with respect to such State. Whenever the Administrator determines that a State is not administering the certification program in accordance with the plan approved under this section, he shall so notify the State and provide for a hearing at the request of the State, and, if appropriate corrective action is not taken within a reasonable time, not to exceed ninety days, the Administrator shall withdraw approval of such plan.

P.L. 94-140
89 Stat. 754

7 USC 136w.

"(c) INSTRUCTION IN INTEGRATED PEST MANAGEMENT TECHNIQUES.—Standards prescribed by the Administrator for the certification of applicators of pesticides under subsection (a), and State plans submitted to the Administrator under subsections (a) and (b), shall include provisions for making instructional materials concerning integrated pest management techniques available to individuals at their request in accordance with the provisions of section 23(c) of this Act, but such plans may not require that any individual receive instruction concerning such techniques or be shown to be competent with respect to the use of such techniques. The Administrator and States implementing such plans shall provide that all interested individuals are notified of the availability of such instructional materials."

### "SEC. 5. EXPERIMENTAL USE PERMITS.

"(a) ISSUANCE.—Any person may apply to the Administrator for an experimental use permit for a pesticide. The Administrator may issue an experimental use permit if he determines that the applicant needs such permit in order to accumulate information necessary to register a pesticide under section 3. An application for an experimental use permit may be filed at the time of or before or after an application for registration is filed.

"(b) TEMPORARY TOLERANCE LEVEL.—If the Administrator determines that the use of a pesticide may reasonably be expected to result in any residue on or in food or feed, he may establish a temporary tolerance level for the residue of the pesticide before issuing the experimental use permit.

"(c) USE UNDER PERMIT.—Use of a pesticide under an experimental use permit shall be under the supervision of the Administrator, and shall be subject to such terms and conditions and be for such period of time as the Administrator may prescribe in the permit.

"(d) STUDIES.—When any experimental use permit is issued for a pesticide containing any chemical or combination of chemicals which has not been included in any previously registered pesticide, the Administrator may specify that studies be conducted to detect whether the use of the pesticide under the permit may cause unreasonable adverse effects on the environment. All results of such studies shall be reported to the Administrator before such pesticide may be registered under section 3.

"(e) REVOCATION.—The Administrator may revoke any experimental use permit, at any time, if he finds that its terms or conditions are being violated, or that its terms and conditions are inadequate to avoid unreasonable adverse effects on the environment.

"(f) STATE ISSUANCE OF PERMITS.—Notwithstanding the foregoing provisions of this section, the Administrator may, under such terms and conditions as he may by regulations prescribe, authorize any State to issue an experimental use permit for a pesticide. All provisions of section 4 relating to State plans shall apply with equal force to a State plan for the issuance of experimental use permits under this section.

P.L. 94-140
89 Stat. 754

"(g) EXEMPTION FOR AGRICULTURAL RESEARCH AGENCIES.—Notwithstanding the foregoing provisions of this section, the Administrator may issue an experimental use permit for a pesticide to any public or private agricultural research agency or educational institution which applies for such permit. Each permit shall not exceed more than a one-year period or such other specific time as the Administrator may prescribe. Such permit shall be issued under such terms and conditions restricting the use of the pesticide as the Administrator may require: *Provided*, That such pesticide may be used only by such research agency or educational institution for purposes of experimentation."

## "SEC. 6. ADMINISTRATIVE REVIEW; SUSPENSION.

"(a) CANCELLATION AFTER FIVE YEARS—

Publication in Federal Register.

"(1) PROCEDURE.—The Administrator shall cancel the registration of any pesticide at the end of the five-year period which begins on the date of its registration (or at the end of any five-year period thereafter) unless the registrant, or other interested person with the concurrence of the registrant, before the end of such period, requests in accordance with regulations prescribed by the Administrator that the registration be continued in effect: *Provided*, That the Administrator may permit the continued sale and use of existing stocks of a pesticide whose registration is canceled under this subsection or subsection (b) to such extent, under such conditions, and for such uses as he may specify if he determines that such sale or use is not inconsistent with the purposes of this Act and will not have unreasonable adverse effects on the environment. The Administrator shall publish in the Federal Register, at least 30 days prior to the expiration of such five-year period, notice that the registration will be canceled if the registrant or other interested person with the concurrence of the registrant does not request that the registration be continued in effect.

"(2) INFORMATION.—If at any time after the registration of a pesticide the registrant has additional factual information regarding unreasonable adverse effects on the environment of the pesticide, he shall submit such information to the Administrator.

"(b) CANCELLATION AND CHANGE IN CLASSIFICATION.—If it appears to the Administrator that a pesticide or its labeling or other material required to be submitted does not comply with the provisions of this Act or, when used in accordance with widespread and commonly recognized practice, generally causes unreasonable adverse effects on the environment, the Administrator may issue a notice of his intent either—

"(1) to cancel its registration or to change its classification together with the reasons (including the factual basis) for his action, or

Hearing.

"(2) to hold a hearing to determine whether or not its registration should be canceled or its classification changed.

P.L. 94-140
89 Stat. 751

Publication in Federal Register.

Ante, p. 753.

Such notice shall be sent to the registrant and made public. In determining whether to issue any such notice, the Administrator shall include among those factors to be taken into account the impact of the action proposed in such notice on production and prices of agricultural commodities, retail food prices, and otherwise on the agricultural economy. At least 60 days prior to sending such notice to the registrant or making public such notice, whichever occurs first, the Administrator shall provide the Secretary of Agriculture with a copy of such notice and an analysis of such impact on the agricultural economy. If the Secretary comments in writing to the Administrator regarding the notice and analysis within 30 days after receiving them, the Administrator shall publish in the Federal Register (with the notice) the comments of the Secretary and the response of the Administrator with regard to the Secretary's comments. If the Secretary does not comment in writing to the Administrator regarding the notice and analysis within 30 days after receiving them, the Administrator may notify the registrant and make public the notice at any time after such 30-day period notwithstanding the foregoing 60-day time requirement. The time requirements imposed by the preceding 3 sentences may be waived or modified to the extent agreed upon by the Administrator and the Secretary. Notwithstanding any other provision of this subsection (b) and section 25(d), in the event that the Administrator determines that suspension of a pesticide registration is necessary to prevent an imminent hazard to human health, then upon such a finding the Administrator may waive the requirement of notice to and consultation with the Secretary of Agriculture pursuant to subsection (b) and of submission to the Scientific Advisory Panel pursuant to section 25(d) and proceed in accordance with subsection (c). The proposed action shall become final and effective at the end of 30 days from receipt by the registrant, or publication, of a notice issued under paragraph (1), whichever occurs later, unless within that time either (i) the registrant makes the necessary corrections, if possible, or (ii) a request for a hearing is made by a person adversely affected by the notice. In the event a hearing is held pursuant to such a request or to the Administrator's determination under paragraph (2), a decision pertaining to registration or classification issued after completion of such hearing shall be final.

P.L. 94-140
89 Stat. 751

In taking any final action under this subsection, the Administrator shall include among those factors to be taken into account the impact of such final action on production and prices of agricultural commodities, retail food prices, and otherwise on the agricultural economy, and he shall publish in the Federal Register an analysis of such impact.

"(c) Suspension.—

"(1) Order.—If the Administrator determines that action is necessary to prevent an imminent hazard during the time required for cancellation or change in classification proceedings he may, by order, suspend the registration of the pesticide immediately. No order of suspension may be issued unless the Administrator has issued or at the same time issues notice of his intention to cancel the registration or change the classification of the pesticide.

"Except as provided in paragraph (3), the Administrator shall notify the registrant prior to issuing any suspension order. Such notice shall include findings pertaining to the question of 'imminent hazard'. The registrant shall then have an opportunity, in accordance with the provisions of paragraph (2), for an expedited hearing before the Agency on the question of whether an imminent hazard exists.

"(2) Expedite hearing.—If no request for a hearing is submitted to the Agency within five days of the registrant's receipt of the notification provided for by paragraph (1), the suspension order may be issued and shall take effect and shall not be reviewable by a court. If a hearing is requested, it shall commence within five days of the receipt of the request for such hearing unless the registrant and the Agency agree that it shall commence at a later time. The hearing shall be held in accordance with the provisions of subchapter II of title 5 of the United States Code, except that the presiding officer need not be a certified hearing examiner. The presiding officer shall have ten days from the conclusion of the presentation of evidence to submit recommended findings and conclusions to the Administrator, who shall then have seven days to render a final order on the issue of suspension.

**80 Stat. 381;**
**81 Stat. 54.**
**5 USC 551.**

"(3) Emergency order.—Whenever the Administrator determines that an emergency exists that does not permit him to hold a hearing before suspending, he may issue a suspension order in advance of notification to the registrant. In that case, paragraph (2) shall apply except that (i) the order of suspension shall be in effect pending the expeditious completion of the remedies provided by that paragraph and the issuance of a final order on suspension, and (ii) no party other than the registrant and the Agency shall participate except that any person adversely affected may file briefs within the time allotted by the Agency's rules. Any person so filing briefs shall be considered a party to such proceeding for the purpose of section 16(b).

"(4) Judicial review.—A final order on the question of suspension following a hearing shall be reviewable in accordance with Section 16 of this Act, notwithstanding the fact that any related cancellation proceedings have not been completed. Petitions to review orders on the issue of suspension shall be advanced on the docket of the courts of appeals. Any order of suspension entered prior to a hearing before the Administrator shall be subject to immediate review in an action by the registrant or other interested person with the concurrence of the registrant in an appropriate district court, solely to determine whether the order of suspension was arbitrary, capricious or an abuse of discretion, or whether the order was issued in accordance with the procedures established by law. The effect of any order of the court will be only to stay the effectiveness of the suspension order, pending the Administrator's final decision with respect to cancellation or change in classification. This action may be maintained simultaneously with any administrative review proceeding under this section. The commencement of proceedings under this paragraph shall not operate as a stay of order, unless ordered by the court.

"(d) Public Hearings and Scientific Review.—In the event a hearing is requested pursuant to subsection (b) or determined upon by the Administrator pursuant to subsection (b), such hearing shall be held after due notice for the purpose of receiving evidence relevant and material to the issues raised by the objections filed by the applicant or other interested parties, or to the issues stated by the Administrator, if the hearing is called by the Administrator rather than by the filing of objections. Upon a showing of relevance and reasonable scope of evidence sought by any party to a public hearing, the Hearing Examiner shall issue a subpena to compel testimony or production of documents from any person. The Hearing Examiner shall be guided by the principles of the Federal Rules of Civil Procedure in making any order for the protection of the witness or the content of documents produced and shall order the payment of reasonable fees and expenses as a condition to requiring testimony of the witness. On contest, the subpena may be enforced by an appropriate United States district court

**Subpena.**

**28 USC app.**

in accordance with the principles stated herein. Upon the request of any party to a public hearing and when in the Hearing Examiner's judgment it is necessary or desirable, the Hearing Examiner shall at any time before the hearing record is closed refer to a Committee of the National Academy of Sciences the relevant questions of scientific fact involved in the public hearing. No member of any committee of the National Academy of Sciences established to carry out the functions of this section shall have a financial or other conflict of interest with respect to any matter considered by such committee. The Committee of the National Academy of Sciences shall report in writing to the Hearing Examiner within 60 days after such referral on these questions of scientific fact. The report shall be made public and shall be considered as part of the hearing record. The Administrator shall enter into appropriate arrangements with the National Academy of Sciences to assure an objective and competent scientific review of the questions presented to Committees of the Academy and to provide such other scientific advisory services as may be required by the Administrator for carrying out the purposes of this Act. As soon as practicable after completion of the hearing (including the report of the Academy) but not later than 90 days thereafter, the Administrator shall evaluate the data and reports before him and issue an order either revoking his notice of intention issued pursuant to this section, or shall issue an order either canceling the registration, changing the classification, denying the registration, or requiring modification of the labeling or packaging of the article. Such order shall be based only on substantial evidence of record of such hearing and shall set forth detailed findings of fact upon which the order is based.

**Report.**

"(e) JUDICIAL REVIEW.—Final orders of the Administrator under this section shall be subject to judicial review pursuant to section 16.

## "SEC. 7. REGISTRATION OF ESTABLISHMENTS.

"(a) REQUIREMENT.—No person shall produce any pesticide subject to this Act in any State unless the establishment in which it is produced is registered with the Administrator. The application for registration of any establishment shall include the name and address of the establishment and of the producer who operates such establishment.

"(b) REGISTRATION.—Whenever the Administrator receives an application under subsection (a), he shall register the establishment and assign it an establishment number.

"(c) INFORMATION REQUIRED.—

"(1) Any producer operating an establishment registered under this section shall inform the Administrator within 30 days after it is registered of the types and amounts of pesticides—

"(A) which he is currently producing;

"(B) which he has produced during the past year; and

"(C) which he has sold or distributed during the past year.

The information required by this paragraph shall be kept current and submitted to the Administrator annually as required under such regulations as the Administrator may prescribe.

"(2) Any such producer shall, upon the request of the Administrator for the purpose of issuing a stop sale order pursuant to section 13, inform him of the name and address of any recipient of any pesticide produced in any registered establishment which he operates.

"(d) CONFIDENTIAL RECORDS AND INFORMATION.—Any information submitted to the Administrator pursuant to subsection (c) shall be considered confidential and shall be subject to the provisions of section 10.

## "SEC. 8. BOOKS AND RECORDS.

**Regulations.**

"(a) REQUIREMENTS.—The Administrator may prescribe regulations requiring producers to maintain such records with respect to their operations and the pesticides and devices produced as he determines are necessary for the effective enforcement of this Act. No records required under this subsection shall extend to financial data, sales data other than shipment data, pricing data, personnel data, and research data (other than data relating to registered pesticides or to a pesticide for which an application for registration has been filed).

"(b) INSPECTION.—For the purposes of enforcing the provisions of this Act, any producer, distributor, carrier, dealer, or any other person who sells or offers for sale, delivers or offers for delivery any pesticide or device subject to this Act, shall, upon request of any officer or employee of the Environmental Protection Agency or of any State or political subdivision, duly designated by the Administrator, furnish or permit such person at all reasonable times to have access to, and to copy: (1) all records showing the delivery, movement, or holding of such pesticide or device, including the quantity, the date of shipment and receipt, and the name of the consignor and consignee; or (2) in the event of the inability of any person to produce records containing such information, all other records and information relating to such delivery, movement, or holding of the pesticide or device. Any inspection with respect to any records and information referred to in this subsection shall not extend to financial data, sales data other than shipment data, pricing data, personnel data, and research data (other than data relating to registered pesticides or to a pesticide for which an application for registration has been filed).

## "SEC. 9. INSPECTION OF ESTABLISHMENTS, ETC.

"(a) IN GENERAL.—For purposes of enforcing the provisions of this Act, officers or employees duly designated by the Administrator are authorized to enter at reasonable times, any establishment or other place where pesticides or devices are held for distribution or sale for the purpose of inspecting and obtaining samples of any pesticides or devices, packaged, labeled, and released for shipment, and samples of any containers or labeling for such pesticides or devices.

Before undertaking such inspection, the officers or employees must present to the owner, operator, or agent in charge of the establishment or other place where pesticides or devices are held for distribution or sale, appropriate credentials and a written statement as to the reason for the inspection, including a statement as to whether a violation of the law is suspected. If no violation is suspected, an alternate and sufficient reason shall be given in writing. Each such inspection shall be commenced and completed with reasonable promptness. If the officer or employee obtains any samples, prior to leaving the premises, he shall give to the owner, operator, or agent in charge a receipt describing the samples obtained and, if requested, a portion of each such sample equal in volume or weight to the portion retained. If an analysis is made of such samples, a copy of the results of such analysis shall be furnished promptly to the owner, operator, or agent in charge.

"(b) WARRANTS.—For purposes of enforcing the provisions of this Act and upon a showing to an officer or court of competent jurisdiction that there is reason to believe that the provisions of this Act have been violated, officers or employees duly designated by the Administrator are empowered to obtain and to execute warrants authorizing—

"(1) entry for the purpose of this section;

"(2) inspection and reproduction of all records showing the quantity, date of shipment, and the name of consignor and consignee of any pesticide or device found in the establishment which is adulterated, misbranded, not registered (in the case of a pesticide) or otherwise in violation of this Act and in the event of the inability of any person to produce records containing such information, all other records and information relating to such delivery, movement, or holding of the pesticide or device; and

"(3) the seizure of any pesticide or device which is in violation of this Act.

"(c) ENFORCEMENT.—

"(1) CERTIFICATION OF FACTS TO ATTORNEY GENERAL.—The examination of pesticides or devices shall be made in the Environmental Protection Agency or elsewhere as the Administrator may designate for the purpose of determining from such examinations whether they comply with the requirements of this Act. If it shall appear from any such examination that they fail to comply with the requirements of this Act, the Administrator shall cause notice to be given to the person against whom criminal or civil proceedings are contemplated. Any person so notified shall be given an opportunity to present his views, either orally or in writing, with regard to such contemplated proceedings, and if in the opinion of the Administrator it appears that the provisions of this Act have been violated by such person, then the Administrator shall certify the facts to the Attorney General, with a copy of the results of the analysis or the examination of such pesticide for the institution of a criminal proceeding pursuant to section 14(b) or a civil proceeding under section 14(a), when the Administrator determines that such action will be sufficient to effectuate the purposes of this Act.

"(2) NOTICE NOT REQUIRED.—The notice of contemplated proceedings and opportunity to present views set forth in this subsection are not prerequisites to the institution of any proceeding by the Attorney General.

"(3) WARNING NOTICES.—Nothing in this Act shall be construed as requiring the Administrator to institute proceedings for prosecution of minor violations of this Act whenever he believes that the public interest will be adequately served by a suitable written notice of warning.

### "SEC. 10. PROTECTION OF TRADE SECRETS AND OTHER INFORMATION.

"(a) In General.—In submitting data required by this Act, the applicant may (1) clearly mark any portions thereof which in his opinion are trade secrets or commercial or financial information and (2) submit such marked material separately from other material required to be submitted under this Act.

"(b) Disclosure.—Notwithstanding any other provision of this Act, the Administrator shall not make public information which in his judgment contains or relates to trade secrets or commercial or financial information obtained from a person and privileged or confidential, except that, when necessary to carry out the provisions of this Act, information relating to formulas of products acquired by authorization of this Act may be revealed to any Federal agency consulted and may be revealed at a public hearing or in findings of fact issued by the Administrator.

"(c) Disputes.—If the Administrator proposes to release for inspection information which the applicant or registrant believes to be protected from disclosure under subsection (b), he shall notify the applicant or registrant, in writing, by certified mail. The Administrator shall not thereafter make available for inspection such data until thirty days after receipt of the notice by the applicant or registrant. During this period, the applicant or registrant may institute an action in an appropriate district court for a declaratory judgment as to whether such information is subject to protection under subsection (b).

### "SEC. 11. STANDARDS APPLICABLE TO PESTICIDE APPLICATORS.

"(a) In General.—No regulations prescribed by the Administrator for carrying out the provisions of this Act shall require any private applicator to maintain any records or file any reports or other documents.

"(b) Separate Standards.—When establishing or approving standards for licensing or certification, the Administrator shall establish separate standards for commercial and private applicators.

### "SEC. 12. UNLAWFUL ACTS.

"(a) In General.—

"(1) Except as provided by subsection (b), it shall be unlawful for any person in any State to distribute, sell, offer for sale, hold for sale, ship, deliver for shipment, or receive and (having so received) deliver or offer to deliver, to any person—

"(A) any pesticide which is not registered under section 3, except as provided by section 6(a)(1);

"(B) any registered pesticide if any claims made for it as a part of its distribution or sale substantially differ from any claims made for it as a part of the statement required in connection with its registration under section 3;

"(C) any registered pesticide the composition of which differs at the time of its distribution or sale from its composition as described in the statement required in connection with its registration under section 3;

"(D) any pesticide which has not been colored or discolored pursuant to the provisions of section 25(c)(5);

"(E) any pesticide which is adulterated or misbranded; or

"(F) any device which is misbranded.

"(2) It shall be unlawful for any person—

"(A) to detach, alter, deface, or destroy, in whole or in part, any labeling required under this Act;

"(B) to refuse to keep any records required pursuant to section 8, or to refuse to allow the inspection of any records or establishment pursuant to section 8 or 9, or to refuse to allow an officer or employee of the Environmental Protection Agency to take a sample of any pesticide pursuant to section 9;

"(C) to give a guaranty or undertaking provided for in subsection (b) which is false in any particular, except that a person who receives and relies upon a guaranty authorized under subsection (b) may give a guaranty to the same effect, which guaranty shall contain, in addition to his own name and address, the name and address of the person residing in the United States from whom he received the guaranty or undertaking;

"(D) to use for his own advantage or to reveal, other than to the Administrator, or officials or employees of the Environmental Protection Agency or other Federal executive agencies, or to the courts, or to physicians, pharmacists, and other qualified persons, needing such information for the performance of their duties, in accordance with such directions as the Administrator may prescribe, any information acquired by authority of this Act which is confidential under this Act;

"(E) who is a registrant, wholesaler, dealer, retailer, or other distributor to advertise a produce registered under this Act for restricted use without giving the classification of the product assigned to it under section 3;

"(F) to make available for use, or to use, any registered pesticide classified for restricted use for some or all purposes other than in accordance with section 3(d) and any regulations thereunder;

"(G) to use any registered pesticide in a manner inconsistent with its labeling;

"(H) to use any pesticide which is under an experimental use permit contrary to the provisions of such permit;

"(I) to violate any order issued under section 13;

"(J) to violate any suspension order issued under section 6;

"(K) to violate any cancellation of registration of a pesticide under section 6, except as provided by section 6(a)(1);

"(L) who is a producer to violate any of the provisions of section 7;

"(M) to knowingly falsify all or part of any application for registration, application for experimental use permit, any information submitted to the Administrator pursuant to section 7, any records required to be maintained pursuant to section 8, any report filed under this Act, or any information marked as confidential and submitted to the Administrator under any provision of this act;

"(N) who is a registrant, wholesaler, dealer, retailer, or other distributor to fail to file reports required by this Act;

"(O) to add any substance to, or take any substance from, any pesticide in a manner that may defeat the purpose of this Act; or

"(P) to use any pesticide in tests on human beings unless such human beings (i) are fully informed of the nature and purposes of the test and of any physical and mental health consequences which are reasonably foreseeable therefrom, and (ii) freely volunteer to participate in the test.

"(b) EXEMPTIONS.—The penalties provided for a violation of paragraph (1) of subsection (a) shall not apply to—

"(1) any person who establishes a guaranty signed by, and containing the name and address of, the registrant or person residing in the United States from whom he purchased or received in good faith the pesticide in the same unbroken package, to the effect that the pesticide was lawfully registered at the time of sale and delivery to him, and that it complies with the other requirements of this Act, and in such case the guarantor shall be subject to the penalties which would otherwise attach to the person holding the guaranty under the provisions of this Act;

"(2) any carrier while lawfully shipping, transporting, or delivering for shipment any pesticide or device, if such carrier upon request of any officer or employee duly designated by the Administrator shall permit such officer or employee to copy all of its records concerning such pesticide or device;

"(3) any public official while engaged in the performance of his official duties;

"(4) any person using or possessing any pesticide as provided by an experimental use permit in effect with respect to such pesticide and such use or possession; or

"(5) any person who ships a substance or mixture of substances being put through tests in which the purpose is only to determine its value for pesticide purposes or to determine its toxicity or other properties and from which the user does not expect to receive any benefit in pest control from its use.

## "SEC. 13. STOP SALE, USE, REMOVAL, AND SEIZURE.

"(a) STOP SALE, ETC., ORDERS.—Whenever any pesticide or device is found by the Administrator in any State and there is reason to believe on the basis of inspection or tests that such pesticide or device is in violation of any of the provisions of this Act, or that such pesticide or device has been or is intended to be distributed or sold in violation of any such provisions, or when the registration of the pesticide has been canceled by a final order or has been suspended, the Administrator may issue a written or printed 'stop sale, use, or removal' order to any person who owns, controls, or has custody of such pesticide or device, and after receipt of such order no person shall sell, use, or remove the pesticide or device described in the order except in accordance with the provisions of the order.

"(b) SEIZURE.—Any pesticide or device that is being transported or, having been transported, remains unsold or in original unbroken packages, or that is sold or offered for sale in any State, or that is imported from a foreign country, shall be liable to be proceeded against in any district court in the district where it is found and seized for confiscation by a process in rem for condemnation if—

"(1) in the case of a pesticide—

"(A) it is adulterated or misbranded;

"(B) it is not registered pursuant to the provisions of section 3;

"(C) its labeling fails to bear the information required by this Act;

"(D) it is not colored or discolored and such coloring or discoloring is required under this Act; or

"(E) any of the claims made for it or any of the directions for its use differ in substance from the representations made in connection with its registration;

"(2) in the case of a device, it is misbranded; or

"(3) in the case of a pesticide or device, when used in accordance with the requirements imposed under this Act and as directed by the labeling, it nevertheless causes unreasonable adverse effects on the environment. In the case of a plant regulator, defoliant, or desiccant, used in accordance with the label claims and recommendations, physical or physiological effects on plants or parts thereof shall not be deemed to be injury, when such effects are the purpose for which the plant regulator, defoliant, or desiccant was applied.

"(c) Disposition After Condemnation.—If the pesticide or device is condemned it shall, after entry of the decree, be disposed of by destruction or sale as the court may direct and the proceeds, if sold, less the court costs, shall be paid into the Treasury of the United States, but the pesticide or device shall not be sold contrary to the provisions of this Act or the laws of the jurisdiction in which it is sold: *Provided*, That upon payment of the costs of the condemnation proceedings and the execution and delivery of a good and sufficient bond conditioned that the pesticide or device shall not be sold or otherwise disposed of contrary to the provisions of the Act or the laws of any jurisdiction in which sold, the court may direct that such pesticide or device be delivered to the owner thereof. The proceedings of such condemnation cases shall conform, as near as may be to the proceedings in admiralty, except that either party may demand trial by jury of any issue of fact joined in any case, and all such proceedings shall be at the suit of and in the name of the United States.

"(d) Court Costs, Etc.—When a decree of condemnation is entered against the pesticide or device, court costs and fees, storage, and other proper expenses shall be awarded against the person, if any, intervening as claimant of the pesticide or device.

### "SEC. 14. PENALTIES.

"(a) Civil Penalties.—

"(1) In General.—Any registrant, commercial applicator, wholesaler, dealer, retailer, or other distributor who violates any provision of this Act may be assessed a civil penalty by the Administrator of not more than $5,000 for each offense.

"(2) Private Applicator.—Any private applicator or other person not included in paragraph (1) who violates any provision of this Act subsequent to receiving a written warning from the Administrator or following a citation for a prior violation, may be assessed a civil penalty by the Administrator of not more than $1,000 for each offense.

"(3) Hearing.—No civil penalty shall be assessed unless the person charged shall have been given notice and opportunity for a hearing on such charge in the county, parish, or incorporated city of the residence of the person charged. In determining the amount of the penalty the Administrator shall consider the appropriateness of such penalty to the size of the business of the person charged, the effect on the person's ability to continue in business, and the gravity of the violation.

"(4) References to Attorney General.—In case of inability to collect such civil penalty or failure of any person to pay all, or such portion of such civil penalty as the Administrator may determine, the Administrator shall refer the matter to the Attorney General, who shall recover such amount by action in the appropriate United States district court.

"(b) Criminal Penalties.—

"(1) In General.—Any registrant, commercial applicator, wholesaler, dealer, retailer, or other distributor who knowingly violates any provision of this Act shall be guilty of a misdemeanor and shall on conviction be fined not more than $25,000, or imprisoned for not more than one year, or both.

"(2) Private applicator.—Any private applicator or other person not included in paragraph (1) who knowingly violates any provision of this Act shall be guilty of a misdemeanor and shall on conviction be fined not more than $1,000, or imprisoned for not more than 30 days, or both.

"(3) Disclosure of information.—Any person,, who, with intent to defraud, uses or reveals information relative to formulas of products acquired under the authority of section 3, shall be fined not more than $10,000, or imprisoned for not more than three years, or both.

"(4) Acts of officers, agents, etc.—When construing and enforcing the provisions of this Act, the act, omission, or failure of any officer, agent, or other person acting for or employed by any person shall in every case be also deemed to be the act, omission, or failure of such person as well as that of the person employed.

## "SEC. 15. INDEMNITIES.

"(a) Requirement.—If—

"(1) the Administrator notifies a registrant that he has suspended the registration of a pesticide because such action is necessary to prevent an imminent hazard;

"(2) the registration of the pesticide is canceled as a result of a final determination that the use of such pesticide will create an imminent hazard; and

"(3) any person who owned any quantity of such pesticide immediately before the notice to the registrant under paragraph (1) suffered losses by reason of suspension or cancellation of the registration,

the Administrator shall make an indemnity payment to such person, unless the Administrator finds that such person (i) had knowledge of facts which, in themselves, would have shown that such pesticide did not meet the requirements of section 3(c)(5) for registration, and (ii) continued thereafter to produce such pesticide without giving timely notice of such facts to the Administrator.

"(b) Amount of Payment.—

"(1) In general.—The amount of the indemnity payment under subsection (a) to any person shall be determined on the basis of the cost of the pesticide owned by such person immediately before the notice to the registrant referred to in subsection (a)(1); except that in no event shall an indemnity payment to any person exceed the fair market value of the pesticide owned by such person immediately before the notice referred to in subsection (a)(1).

"(2) Special rule.—Notwithstanding any other provision of this Act, the Administrator may provide a reasonable time for use or other disposal of such pesticide. In determining the quantity of any pesticide for which indemnity shall be paid under this subsection, proper adjustment shall be made for any pesticide used or otherwise disposed of by such owner.

## "SEC. 16. ADMINISTRATIVE PROCEDURE; JUDICIAL REVIEW.

"(a) District Court Review.—Except as is otherwise provided in this Act, Agency refusals to cancel or suspend registrations or change classifications not following a hearing and other final Agency actions not committed to Agency discretion by law are judicially reviewable in the district courts.

"(b) Review by Court of Appeals.—In the case of actual controversy as to the validity of any order issued by the Administrator following a public hearing, any person who will be adversely affected by such order and who had been a party to the proceedings may obtain judicial review by filing in the United States court of appeals for the circuit wherein such person resides or has a place of business, within 60 days after the entry of such order, a petition praying that the order be set aside in whole or in part. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Administrator or any officer designated by him for that purpose, and thereupon the Administrator shall file in the court the record of the proceedings on which he based his order, as provided in section 2112 of title 28, United States Code. Upon the filing of such petition the court shall have exclusive jurisdiction to affirm or set aside the order complained of in whole or in part. The court shall consider all evidence of record. The order of the Administrator shall be sustained if it is supported by substantial evidence when considered on the record as a whole. The judgment of the court affirming or setting aside, in whole or in part, any order under this section shall be final, subject to review by the Supreme Court of the United States upon certiorari or certification as provided in section 1254 of title 28 of the United States Code. The commencement of proceedings under this section shall not, unless specifically ordered by the court to the contrary, operate as a stay of an order. The court shall advance on the docket and expedite the disposition of all cases filed therein pursuant to this section.

72 Stat. 941; 80 Stat. 1323.

62 Stat. 928.

"(c) JURISDICTION OF DISTRICT COURTS.—The district courts of the United States are vested with jurisdiction specifically to enforce, and to prevent and restrain violations of, this Act.

"(d) NOTICE OF JUDGMENTS.—The Administrator shall, by publication in such manner as he may prescribe, give notice of all judgments entered in actions instituted under the authority of this Act.

### "SEC. 17. IMPORTS AND EXPORTS.

"(a) PESTICIDES AND DEVICES INTENDED FOR EXPORT.—Notwithstanding any other provision of this Act, no pesticide or device shall be deemed in violation of this Act when intended solely for export to any foreign country and prepared or packed according to the specifications or directions of the foreign purchaser, except that producers of such pesticides and devices shall be subject to section 8 of this Act.

(b) CANCELLATION NOTICES FURNISHED TO FOREIGN GOVERNMENTS.—Whenever a registration, or a cancellation or suspension of the registration of a pesticide becomes effective, or ceases to be effective, the Administrator shall transmit through the State Department notification thereof to the governments of other countries and to appropriate international agencies.

"(c) IMPORTATION OF PESTICIDES AND DEVICES.—The Secretary of the Treasury shall notify the Administrator of the arrival of pesticides and devices and shall deliver to the Administrator, upon his request, samples of pesticides or devices which are being imported into the United States, giving notice to the owner or consignee, who may appear before the Administrator and have the right to introduce testimony. If it appears from the examination of a sample that it is adulterated, or misbranded or otherwise violates the provisions set forth in this Act, or is otherwise injurious to health or the environment, the pesticide or device may be refused admission, and the Secretary of the Treasury shall refuse delivery to the consignee and shall cause the destruction of any pesticide or device refused delivery which shall not be exported by the consignee within 90 days from the date of notice of such refusal under such regulations as the Secretary of the Treasury may prescribe: *Provided*, That the Secretary of the Treasury may deliver to the consignee such pesticide or device pending examination and decision in the matter on execution of bond for the amount of the full invoice value of such pesticide or device, together with the duty thereon, and on refusal to return such pesticide or device for any cause to the custody of the Secretary of the Treasury, when demanded, for the purpose of excluding them from the country, or for any other purpose, said consignee shall forfeit the full amount of said bond: *And provided further*, That all charges for storage, cartage, and labor on pesticides or devices which are refused admission or delivery shall be paid by the owner or consignee, and in default of such payment shall constitute a lien against any future importation made by such owner or consignee.

"(d) COOPERATION IN INTERNATIONAL EFFORTS.—The Administrator shall, in cooperation with the Department of State and any other appropriate Federal agency, participate and cooperate in any international efforts to develop improved pesticide research and regulations.

"(e) REGULATIONS.—The Secretary of the Treasury, in consultation with the Administrator, shall prescribe regulations for the enforcement of subsection (c) of this section.

### "SEC. 18. EXEMPTION OF FEDERAL AGENCIES.

"The Administrator may, at his discretion, exempt any Federal or State agency from any provision of this Act if he determines that emergency conditions exist which require such exemption.

P.L. 94-140
89 Stat. 754

"The Administrator, in determining whether or not such emergency conditions exist, shall consult with the Secretary of Agriculture and the Governor of any State concerned if they request such determination."

### "SEC. 19. DISPOSAL AND TRANSPORTATION.

Regulations.

"(a) PROCEDURES.—The Administrator shall, after consultation with other interested Federal agencies, establish procedures and regulations for the disposal or storage of packages and containers of pesticides and for disposal or storage of excess amounts of such pesticides, and accept at convenient locations for safe disposal a pesticide the registration of which is canceled under section 6(c) if requested by the owner of the pesticide.

80 Stat. 944.
74 Stat. 808;
79 Stat. 286.
72 Stat. 776;
83 Stat. 481.
Contract authority.

"(b) ADVICE TO SECRETARY OF TRANSPORTATION.—The Administrator shall provide advice and assistance to the Secretary of Transportation with respect to his functions relating to the transportation of hazardous materials under the Department of Transportation Act (49 U.S.C. 1657), the Transportation of Explosives Act (18 U.S.C. 831–835), the Federal Aviation Act of 1958 (49 U.S.C. 1421–1430, 1472 II), and the Hazardous Cargo Act (46 U.S.C. 170, 375, 416).

### "SEC. 20. RESEARCH AND MONITORING.

"(a) RESEARCH.—The Administrator shall undertake research, including research by grant or contract with other Federal agencies, universities, or others as may be necessary to carry out the purposes of this Act, and he shall give priority to research to develop biologically integrated alternatives for pest control. The Administrator shall also take care to insure that such research does not duplicate research being undertaken by any other Federal agency.

"(b) NATIONAL MONITORING PLAN.—The Administrator shall formulate and periodically revise, in cooperation with other Federal, State, or local agencies, a national plan for monitoring pesticides.

"(c) MONITORING.—The Administrator shall undertake such monitoring activities, including but not limited to monitoring in air, soil, water, man, plants, and animals, as may be necessary for the implementation of this Act and of the national pesticide monitoring plan. Such activities shall be carried out in cooperation with other Federal, State, and local agencies.

### "SEC. 21. SOLICITATION OF COMMENTS; NOTICE OF PUBLIC HEARINGS.

"(a) The Administrator, before publishing regulations under this Act, shall solicit the views of the Secretary of Agriculture in accordance with the procedure described in section 25(a). P.L. 94-140 89 Stat. 752.

"(b) In addition to any other authority relating to public hearings and solicitation of views, in connection with the suspension or cancellation of a pesticide registration or any other actions authorized under this Act, the Administrator may, at his discretion, solicit the views of all interested persons, either orally or in writing, and seek such advice from scientists, farmers, farm organizations, and other qualified persons as he deems proper.

"(c) In connection with all public hearings under this Act the Administrator shall publish timely notice of such hearings in the Federal Register. Publication in Federal Register.

### "SEC. 22. DELEGATION AND COOPERATION.

"(a) DELEGATION.—All authority vested in the Administrator by virtue of the provisions of this Act may with like force and effect be executed by such employees of the Environmental Protection Agency as the Administrator may designate for the purpose.

"(b) COOPERATION.—The Administrator shall cooperate with the Department of Agriculture, any other Federal agency, and any appropriate agency of any State or any political subdivision thereof, in carrying out the provisions of this Act, and in securing uniformity of regulations.

### "SEC. 23. STATE COOPERATION, AID, AND TRAINING.

"(a) COOPERATIVE AGREEMENTS.—The Administrator is authorized to enter into cooperative agreements with States—

> "(1) to delegate to any State the authority to cooperate in the enforcement of the Act through the use of its personnel or facilities, to train personnel of the State to cooperate in the enforcement of this Act, and to assist States in implementing cooperative enforcement programs through grants-in-aid; and
>
> "(2) to assist State agencies in developing and administering State programs for training and certification of applicators consistent with the standards which he prescribes.

"(b) CONTRACTS FOR TRAINING.—In addition, the Administrator is authorized to enter into contracts with Federal or State agencies for the purpose of encouraging the training of certified applicators.

"(c) The Administrator may, in cooperation with the Secretary of Agriculture, utilize the services of the Cooperative State Extension Services for informing farmers of accepted uses and other regulations made pursuant to this Act.

### "SEC. 24. AUTHORITY OF STATES.

"(a) A State may regulate the sale or use of any pesticide or device in the State, but only if and to the extent the regulation does not permit any sale or use prohibited by this Act;

"(b) such State shall not impose or continue in effect any requirements for labeling and packaging in addition to or different from those required pursuant to this Act; and

"(c) a State may provide registration for pesticides formulated for distribution and use within that State to meet special local needs if that State is certified by the Administrator as capable of exercising adequate controls to assure that such registration will be in accord with the purposes of this Act and if registration for such use has not previously been denied, disapproved, or canceled by the Administrator. Such registration shall be deemed registration under section 3 for all purposes of this Act, but shall authorize distribution and use only within such State and shall not be effective for more than 90 days if disapproved by the Administrator within that period.

### "SEC. 25. AUTHORITY OF ADMINISTRATOR.

P.L. 94-140 89 Stat. 751.

"(a) (1) Regulations.—The Administrator is authorized in accordance with the procedure described in paragraph (2), to prescribe regulations to carry out the provisions of this Act. Such regulations shall take into account the difference in concept and usage between various classes of pesticides.

P.L. 94-140 89 Stat. 752

(2) Procedure.——

Publications in Federal Register.

"(A) Proposed regulations.—At least 60 days prior to signing any proposed regulation for publication in the Federal Register, the Administrator shall provide the Secretary of Agriculture with a copy of such regulation. If the Secretary comments in writing to the Administrator regarding any such regulation within 30 days after receiving it, the Administrator shall publish in the Federal Register (with the proposed regulation) the comments of the Secretary and the response of the Administrator with regard to the Secretary's comments. If the Secretary does not comment in writing to the Administrator regarding the regulation within 30 days after receiving it, the Administrator may sign such regulation for publication in the Federal Register any time after such 30-day period notwithstanding the foregoing 60-day time requirement.

Publications in Federal Register.

"(B) Final regulations.—At least 30 days prior to signing any regulation in final form for publication in the Federal Register, the Administrator shall provide the Secretary of Agriculture with a copy of such regulation. If the Secretary comments in writing to the Administrator regarding any such final regulation within 15 days after receiving it, the Administrator shall publish in the Federal Register (with the final regulation) the comments of the Secretary, if requested by the Secretary, and the response of the Administrator concerning the Secretary's comments. If the Secretary does not comment in writing to the Administrator regarding the regulation within 15 days after receiving it, the Administrator may sign such regulation for publication in the Federal Register at any time after such 15-day period notwithstanding the foregoing 30-day time requirement.

"(C) Time requirements.—The time requirements imposed by subparagraphs (A) and (B) may be waived or modified to the extent agreed upon by the Administrator and the Secretary.

"(D) Publication in the Federal Register.—The Administrator shall, simultaneously with any notification to the Secretary of Agriculture under this paragraph prior to the issuance of any proposed or final regulation, publish such notification in the Federal Register.".

P.L. 94-140 89 Stat. 753

"(3) Congressional Committees.—At such time as the Administrator is required under paragraph (2) of this subsection to provide the Secretary of Agriculture with a copy of proposed regulations and a copy of the final form of regulations, he shall also furnish a copy of such regulations to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture and Forestry of the Senate."

"(b) Exemption of Pesticides.—The Administrator may exempt from the requirements of this Act by regulation any pesticide which he determines either (1) to be adequately regulated by another Federal agency, or (2) to be of a character which is unnecessary to be subject to this Act in order to carry out the purposes of this Act.

"(c) Other Authority.—The Administrator, after notice and opportunity for hearing, is authorized—

"(1) to declare a pest any form of plant or animal life (other than man and other than bacteria, virus, and other micro-organisms on or in living man or other living animals) which is injurious to health or the environment;

"(2) to determine any pesticide which contains any substance or substances in quantities highly toxic to man;

84 Stat. 1670. 15 USC 1471 note.

"(3) to establish standards (which shall be consistent with those established under the authority of the Poison Prevention Packaging Act (Public Law 91-601)) with respect to the package, container, or wrapping in which a pesticide or device is enclosed for use or consumption, in order to protect children and adults from serious injury or illness resulting from accidental ingestion or contact with pesticides or devices regulated by this Act as well as to accomplish the other purposes of this Act;

"(4) to specify those classes of devices which shall be subject to any provision of paragraph 2(q)(1) or section 7 of this Act upon his determination that application of such provision is necessary to effectuate the purposes of this Act;

"(5) to prescribe regulations requiring any pesticide to be colored or discolored if he determines that such requirement is feasible and is necessary for the protection of health and the environment; and

"(6) to determine and establish suitable names to be used in the ingredient statement.

**P.L. 94-140**
**89 Stat. 753**
**7 USC 136d.**
**7 USC 136w.**

"(d) SCIENTIFIC ADVISORY PANEL.—The Administrator shall submit to an advisory panel for comment as to the impact on health and the environment of the action proposed in notices of intent issued under section 6(b) and of the proposed and final form of regulations issued under section 25(a) within the same time periods as provided for the comments of the Secretary of Agriculture under such sections. The time requirements for notices of intent and proposed and final forms of regulation may not be modified or waived unless in addition to meeting the requirements of section 6(b) or 25(a), as applicable, the advisory panel has failed to comment on the proposed action within the prescribed time period or has agreed to the modification or waiver. The comments of the advisory panel and the response of the Administrator shall be published in the Federal Register in the same manner as provided for publication of the comments of the Secretary of Agriculture under such sections. The panel referred to in this subsection shall consist of seven members appointed by the Administrator from a list of 12 nominees, six nominated by the National Institutes of Health, and six by the National Science Foundation. The Administrator may require such information from the nominees to the advisory panel as he deems necessary, and he shall publish in the Federal Register the name, address, and professional affiliations of each nominee. Each member of the panel shall receive per diem compensation at a rate not in excess of that fixed for GS-18 of the General Schedule as may be determined by the Administrator, except that any such member who holds another office or position under the Federal Government the compensation for which exceeds such rate may elect to receive compensation at the rate provided for such other office or position in lieu of the compensation provided by this subsection. In order to assure the objectivity of the advisory panel, the Administrator shall promulgate regulations regarding conflicts of interest with respect to the members of the panel.".

**Publication in Federal Register.**

**Members.**

**Publication in Federal Register.**

**Compensation.**
**5 USC 5332 note.**

**P.L. 94-140**
**89 Stat. 754**

**Regulations.**

### "SEC. 26. SEVERABILITY.

"If any provision of this Act or the application thereof to any person or circumstance is held invalid, the invalidity shall not affect other provisions or applications of this Act which can be given effect without regard to the invalid provision or application, and to this end the provisions of this Act are severable.

### "SEC. 27. AUTHORIZATION FOR APPROPRIATIONS.

"There is authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act for each of the fiscal years ending June 30, 1973, June 30, 1974, and June 30, 1975. The amounts authorized to be appropriated for any fiscal year ending after June 30, 1975, shall be the sums hereafter provided by law."

"There are hereby authorized to be appropriated to carry out the provisions of this Act for the period beginning October 1, 1975, and ending September 30, 1976, the sum of $47,868,000, and for the period beginning October 1, 1976, and ending March 31, 1977, the sum of $23,600,000."

**P.L. 94-140**
**89 Stat. 752**

### AMENDMENTS TO OTHER ACTS

SEC. 3. The following Acts are amended by striking out the terms "economic poisons" and "an economic poison" wherever they appear and inserting in lieu thereof "pesticides" and "a pesticide" respectively:

(1) The Federal Hazardous Substances Act, as amended (15 U.S.C. 1261 et seq.); **74 Stat. 372.**

(2) The Poison Prevention Packaging Act, as amended (15 U.S.C. 1471 et seq.); and **84 Stat. 1670.**

(3) The Federal Food, Drug, and Cosmetic Act, as amended (21 U.S.C. 301 et seq.). **52 Stat. 1040.**

### EFFECTIVE DATES OF PROVISIONS OF ACT

SEC. 4. (a) Except as otherwise provided in the Federal Insecticide, Fungicide, and Rodenticide Act, as amended by this Act, and as otherwise provided by this section, the amendments made by this Act shall take effect at the close of the date of the enactment of this Act, provided if regulations are necessary for the implementation of any provision that becomes effective on the date of enactment, such regulations shall be promulgated and shall become effective within 90 days from the date of enactment of this Act.

Savings provision. 61 Stat. 163. 7 USC 135 note. P.L. 94-140 89 Stat. 752

(b) The provisions of the Federal Insecticide, Fungicide, and Rodenticide Act and the regulations thereunder as such existed prior to the enactment of this Act shall remain in effect until superseded by the amendments made by this Act and regulations thereunder: *Provided*, That all provisions made by these amendments and all regulations thereunder shall be effective within five years after the enactment of this Act.

(c)(1) Two years after the enactment of this Act the Administrator shall have promulgated regulations providing for the registration and classification of pesticides under the provisions of this Act and thereafter shall register all new applications under such provisions.

P.L. 94-140 89 Stat. 752

61 Stat. 163. 7 USC 135 note.

(2) After two years but within five years after the enactment of this Act the Administrator shall register and reclassify pesticides registered under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act prior to the effective date of the regulations promulgated under subsection (c)(1).

P.L. 94-140 89 Stat. 752

(3) Any requirements that a pesticide be registered for use only by a certified applicator shall not be effective until five years from the date of enactment of this Act.

P.L. 94-140 89 Stat. 753

(4) A period of five years from date of enactment shall be provided for certification of applicators.

(A) One year after the enactment of this Act the Administrator shall have prescribed the standards for the certification of applicators.

P.L. 94-140 89 Stat. 753

(B) Within four years after the enactment of this Act each State desiring to certify applicators shall submit a State plan to the Administrator for the purpose provided by section 4(b).

(C) As promptly as possible but in no event more than one year after submission of a State plan, the Administrator shall approve the State plan or disapprove it and indicate the reasons for disapproval. Consideration of plans resubmitted by States shall be expedited.

(5) One year after the enactment of this Act the Administrator shall have promulgated and shall make effective regulations relating to the registration of establishments, permits for experimental use, and the keeping of books and records under the provisions of this Act.

(d) No person shall be subject to any criminal or civil penalty imposed by the Federal Insecticide, Fungicide, and Rodenticide Act, as amended by this Act, for any act (or failure to act) occurring before the expiration of 60 days after the Administrator has published effective regulations in the Federal Register and taken such other action as may be necessary to permit compliance with the provisions under which the penalty is to be imposed.

(e) For purposes of determining any criminal or civil penalty or liability to any third person in respect of any act or omission occurring before the expiration of the periods referred to in this section, the Federal Insecticide, Fungicide, and Rodenticide Act shall be treated as continuing in effect as if this Act had not been enacted.

**Public Law 92-516**
**92nd Congress, H. R. 10729**
**October 21, 1972**

*LEGISLATIVE HISTORY:*
HOUSE REPORTS: No. 92-511 (Comm. on Agriculture) and No. 92-1540 (Comm. of Conference).
SENATE REPORTS: No. 92-838 (Comm. on Agriculture and Forestry) and No. 92-970 (Comm. on Commerce).
CONGRESSIONAL RECORD:
Vol. 117 (1971): Nov. 8, 9, considered and passed House.
Vol. 118 (1972): Sept. 26, considered and passed Senate, amended.
Oct. 5, Senate agreed to conference report.
Oct. 12, House agreed to conference report.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS:
Vol. 8, No. 44 (1972): Oct. 21, Presidential statement.

**Public Law 94-140**
**94th Congress, H. R. 8841**
**November 28, 1975**

*LEGISLATIVE HISTORY:*
HOUSE REPORTS: No. 94-497 (Comm. on Agriculture) and No. 94-668 (Comm. of Conference).
SENATE REPORT No. 94-452 (Comm. on Agriculture and Forestry).
CONGRESSIONAL RECORD, Vol. 121 (1975):
Sept. 26, Oct. 8, 9, considered and passed House.
Nov. 12, considered and passed Senate, amended.
Nov. 18, House agreed to conference report.
Nov. 19, Senate agreed to conference report.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1976 O—224-947